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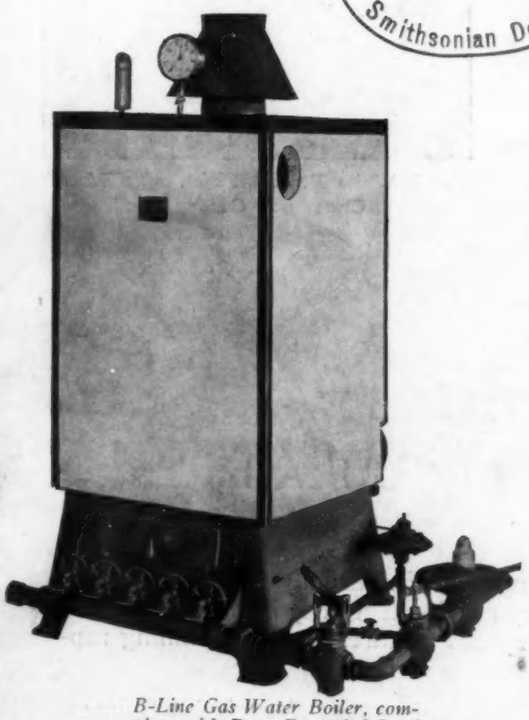
A B-Line Is Proof Against Heat Leakage



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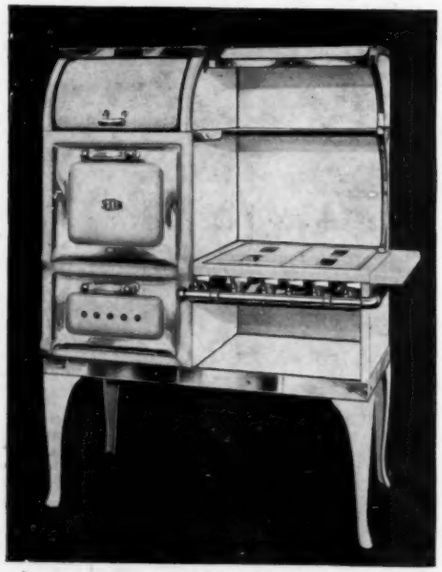

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Publicity Potent Factor

Gas Men Are Told Of Necessity Of Advertising In Promoting Industry's Welfare

Publicity and advertising as factors in the future growth of the gas industry occupied the greater share of attention in the second general session of the American Gas Association's Convention, held in Convention Hall on the Steel Pier, Wednesday morning. Publicity as a means of educating the consuming public to the advantages of gas usage, and likewise in educating company employes and college students to the opportunities presented in our technical schools and universities for a study of gas manufacture were dealt with in four of the principal papers presented. The subject of direct advertising, its relation to sales, and methods of application in obtaining maximum results was outlined in a thoroughly comprehensive survey presented by Professor George Burton Hotchkiss, head of the Department of Marketing, New York University.

The question of safety and safety work in the gas industry were discussed in a brief address by Charles B. Scott, chairman of the Accident Prevention Committee. The McCarter and Beal medals for meritorious service were also awarded.

H. O. LOEBELL DELIVERS ADDRESS

Neglect on the part of the gas industry to take advantage of publicity in breaking down sales resistance to the purchasing of gas and gas appliances was heavily scored in the address delivered by Henry O. Loebell, vice-president of the Combustion Utilities Corporation, New York City. In illustrating his point, Mr. Loebell reviewed the tremendous growth of the electrical industry and the inroads it has made and was making daily in the industrial field. The electrical industry, it was pointed out, had taken full advantage of the medium of publicity; its great earnings had made tremendous expansion possible in entirely new fields of industry. In this connection, Mr. Loebell recalled the present developments taking place in electrical refrigeration.

Lastly, he said that the electrical industry had gone to considerable effort and expense in equitably adjusting rates. As a result of these constructive efforts, it was further remarked, the electrical industry has today become a serious competitor of gas in both domestic and industrial fields. To counteract the increasing sales of electrical appliances, Mr. Loebell stated that the gas industry must work aggressively for a united industrial policy. More in detail, he said that gas manufacturers and appliance manufacturers must introduce differential rates, extend their publicity mediums, and have equipment representing the latest developments in the field.

NEED FOR PUBLICITY EMPHASIZED

Emphasizing much the same need for publicity, Clifford E. Paige, vice-president of the Brooklyn Union Gas Co., dwelt briefly on the early organization of the Public Utility Information Committee. There are now, it was reported, 29 committees operating in 36 states constituting an enterprise so important that today the first National Conference of Committees on Public Utility Information was to be held. Mr. Paige stressed the necessity of courtesy in the treatment of the public and further stated: "There is a good deal of wanting to know in the attitude of the public toward all public utilities, and that makes it necessary that you should tell the public what you are doing. It is impossible to tell it to enough people by word of mouth, so you have to tell it with printer's ink.

"For the purpose of publicity each item sent out should contain news value—something of human interest—an appeal to the public. Such stories will be seized instantly by city editors and be readily published."

SYMPATHETIC PUBLIC UNDERSTANDING REQUIRED

In conclusion of his address, Mr. Paige said: "We require a sympathetic public understanding for the industry to continue to expand at its present rate. Correct understanding is based on information and information is the cornerstone of the state committee plan. Were the state committees eliminated tomorrow, the American Gas Association

Clifford E. Paige
V. P. Brooklyn Union Gas Co.

would find its local publicity contacts lost. We could issue our stories and continue our advertising on a national scale, but there would be no local tie-up, no local public speaking, no local work in the schools and colleges, a serious let down in local advertising and we would have to go back to 1919 and start all over again."

J. S. S. RICHARDSON DELIVERS ENTERTAINING TALK

The more human side of publicity work was taken up by J. S. S. Richardson, director of the Pennsylvania Public Service Information Committee, Philadelphia, Pa. Much of Mr. Richardson's address was enlivened by anecdotes and stories illustrating the difficulties by the publicity man in obtaining information from executive heads of corporations. The real point of Mr. Richardson's talk was a plea to the members to rid themselves of the idea that publicity men "were bombs that might explode at any minute without warning."

CO-OPERATION WITH EDUCATIONAL INSTITUTIONS

The education of employes, and incidentally, the subject of publicity, was considered by W. Griffin Gribbel, chairman of the Committee on Co-operation with Educational Institutions. Educating the consumer to the use of gas, the speaker said, was important, but even more important today was that of educating the boy and girl while at school. He told of the committee's activities in the educational institutions with the idea in mind of interesting the college man to go into the gas industry. By this method, he said, the gas industry has made friends of the heads and instructors of colleges and schools thruout the country. Due, however, to the increasing demands made on the General Committee, Mr. Gribbel asked that the association consider in the near future the advisability of distributing the work in each state among the respective state committees. "Otherwise," he said, "much of the favorable results already attained will be lost due to our inability to deliver the many special lectures requested."

ADVERTISING AND SERVICE

In dealing with the subject of advertising, Professor Hotchkiss made an especially favorable impression on his hearers by the clarity and directness of his remarks.

Henry O. Loebell
V. P. Combustion Utilities Corporation, New York

(*Continued on page* 405)

Financing Appliance Research

Industrial Men Listen to Charles Munroe On Executive Committee Plan

The second session of the Industrial Section of the American Gas Association was held Wednesday afternoon in the Music Room of the Hotel Chalfonte.

Following the introductory remarks of the chairman, H. O. Loebell, vice-president and general manager of the Combustion Utilities Corporation of New York, an address was given entitled "Wholesaling Gas" which was the joint work of H. H. Clark of the Peoples Gas Light and Coke Company of Chicago, and L. C. Harvey of the Illinois Power and Light Corporation.

After touching on the desirability of wholesale gas business and its profits the address went on to deal with its effect on load factors and the efforts required to get the business. Wholesale departments were discussed as to their managers, personnel, how and where to get the men, and the educational courses incident to their training. Various phases of gas were noted and its application listed. Compensation on salary and commission basis was studied. Division of territory, inter-department co-operation, and office methods received attention.

H. O. Andrew, Publicity Chairman of the Publicity Committee, in his report deeply deplored the lack of continuity in publicity which he attributed to the fact that the A. G. A. has no paid agent to handle the same. A motion followed which was carried to refer this matter back to the committee for recommendations on the subject.

CHARLES A. MUNROE ADDRESSES MEETING

The regular order was here suspended to permit Charles A. Munroe, chairman of the Board of Directors, Laclede Gas Light Company of St. Louis, Mo., to present the report from the Executive Committee of the A. G. A. on a

plan to finance the development of industrial gas appliances.

Certain selected companies have been invited to contribute to a fund to be administered by a committee of seven men thoroughly acquainted with this field. This committe will agree on the type and approximate cost of pro-

George B. Evans,
Pres. Laclede Gas Light Co.,
St. Louis, Mo.

jected appliances and report to the Board of Directors. The latter, on approval, will underwrite the expense of the work. When marketed 10 per cent of the gross selling price of the article will go to the A. G. A. until the money advanced is paid back. At the expiration of the five-year period the contributing companies will be repaid.

ADVERTISING

F. F. Cauley, of the Peoples Gas Light and Coke Company of Chicago, chairman of the Advertising Committee, presented a report describing the results of six months' advertising. Recommendations were made that the campaign be continued, that all companies contribute, that a campaign manager be appointed, that an agency be considered, that college publications be included, that the advertising appropriation be increased.

EDUCATION AND TRAINING

J. P. Leinroth, of the Public Service Electric and Gas Company of Newark N. J., chairman of the Committee on Education of Industrial Gas Salesmen, discussed that problem from its many angles in an able report by that committee.

J. J. Quinn, of the Citizens Gas Light Company of Quincy, Mass., chairman of the Committee on Contact with Educational Institutions, briefly reviewed its objective and went on to detail what it had accomplished in supplying qualified lecturers to colleges, etc., and surveys it had made with a view to replacing obsolete gas equipment in college laboratories. A more complete list of available lectures was strongly recommended to meet the increasing demand for such instruction.

RECOMMENDATIONS

The committee made the following recommendations:

The proper conduct of the survey will necessitate considerable supervision. It is something that should be done and can best be handled, it is felt, through the office of the secretary of the Industrial Section, acting in conjunction with the incoming committee chairman.

The list of lecturers is far from complete and the need for definite information as to qualified men and their subjects is each year becoming more urgently needed.

It is suggested that an opportunity be provided next year for an intimate discussion of this subcommittee's possibility between the incoming chairman and the outgoing chairman.

Charles M. Cohen
V. P. Consolidated Gas, Electric Light & Power Co., Baltimore, Md.

There is a great deal that can be done toward properly promoting our industry through this committee activity if adequate consideration is given the subject by next year's sub-committee chairman.

An address was also made on Advertising by V. E. Pratt of New York City.

Public Good Will Vital To Future Financing

First National Conference Discusses Phases of Utility Information Work

"The purpose of the State Public Utility Information Bureau," declared H. C. Abell, President of the A. G. A., at the National Conference on Information Committee Work, at the Hotel Traymore yesterday afternoon, "is much broader in scope than the publicity representative of any special commercial industry.

"The field not only covers the ultimate customers, probable and prospective customers, but also all political, legislative, administrative, and regulatory bodies, and all the constituents of the personnel of those bodies, and in territory and districts where very little or no utility service is rendered."

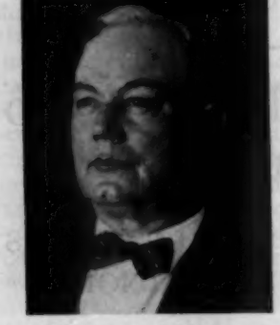
The comparison he drew with

other commercial organizations followed Mr. Abell's development of the similarities and differences of utilities as compared to commercial organizations of every sort. The address gave the keynote of the conference which President Abell had called early in the month to take place during the A. G. A. convention.

Joe Carmichael
Director Iowa Committee

PUBLICITY MEN FROM ALL OVER COUNTRY PRESENT

Not only were the publicity men of the various utilities from Maine to Florida, and from the Atlantic to the Pacific on hand, but many executives were numbered among those present.



Ge orge McQuaid
Director Texas Committee

Continuing on the function of the Information Bureau, President Abell made the point that it was frequently also their lot to educate the public utility executive and operator as well.

"The bureau must present facts," he said, outlining their work, "proper and reliable information and news in various ways to inform the utility's patrons and the whole public regarding the utility's business and affairs, so that all utilities can better fulfil their obligations to the public in facilities and service, by being permitted to conduct their affairs in a purely open business manner.

TASK NOT AS SIMPLE AS IT APPEARS

"The task is not as simple as it might appear. It requires a knowledge of economics, engineering, many of the arts and crafts, accounting, financing, law, commerce, etc., and finally, a proper and correct analysis of all facts."

That the gas industry would need great amounts of money for financing during the next ten years, and that it would be the work of the information bureaus to create the confidence which would lead the public to loosen its purse strings, was an outstanding objective pointed out by President Abell.

To have the director of the State Bureaus, the members of the State Committees, and the gas executives meet and discuss the work, the problems and the accomplishments of the State Bureaus, to the end that all may more fully realize and appreciate the absolute necessity for the continuance of the work in perpetuity and to consider the methods and means of making the work more far-reaching in effect was set forth by President Abell as the purpose of the conference.

(*Continued on page* 405, *second column*)

Technical Men Discuss Distribution in Second Session

Many Phases of Distribution Are Presented at Meeting

The second meeting of the Technical Section was held on the Steel Pier yesterday afternoon and was devoted to the report of the Distribution Committee.

As usual this report was made up of several sections and each sub-committee reported through its own chairman. The chairman of the main committee, H. E. Bates, Assistant Engineer of the Peoples Gas Light and Coke Company, Chicago, Ill., read the introduition to the general report of the committee. He stated therein that experience has shown that a large committee can and will function successfully and that while this may not be true for all committees concerned with gas work, it has been true for the distribution committee.

A series of twenty-four questions on various phases of distribution work were sent out by the committee and the answers to some of these questions as well as a general summary of the other parts of the committee's report will be found in other parts of the Convention Dailies of the American Gas Journal. Part of the report was also concerned with the conclusions reached at the two day conference held in Detroit in June, 1925.

In conclusion Mr. Bates Stated: "It is believed that the 1925 committee's work demonstrates the need of more intelligent and constructive discussion of the many important problems of the distribution engineer and the need of assembling information regarding methods to the end that in so far as possible, they may be standardized."

QUESTIONS ON DISTRIBUTION WORK

As stated above, a large part of the report was concerned with a discussion of a series of twenty-four questions on distribution problems. Thus, for examples the questions included the life of cast iron pipe, maximum pressure for cast iron pipe, use of centrifugal cast pipe, its advantages and dis-

W. M. Henderson
Supt. Gas Distribution, Los Angeles Gas & Electric Co., Los Angeles, California

advantages, the types of joints, recommended process for bronze welding, rate of consumption per consumer, the ideal square mile, high-pressure distribution discussion, automatic loading devices to increase capacity, effect of house heating on distribution, installation of mains in parkways, types and methods of installing drips, use of machinery in main installation, depths and grades for main installation, etc.

DETROIT DISTRIBUTION CONFERENCE

This part of the report was concerned with a discussion of the subjects that were presented at the Detroit Distribution Conference. It was concerned with such matters as the tabulation of statistical data on the life of piping, definition of various terms ordinarily used in distribution practice, the problem of pipe joints, the use of standard forms for recording data regarding operation of mechanical machinery, change in present pipe standards and specifications for demand meters.

DEMAND METERS

The last section of the Distribution Committee report was concerned with recommendations on gas demand recording meters. This report was read by H. C. Deffenbaugh, chairman of the sub-committee, of the Rochester Gas and Electric Corporation, Rochester, N. Y. It discussed the field of application of the demand meter, as well as the type of device that was required.

The meeting then adjourned until Thursday afternoon.

Mary E. Dillon
Mgr. Brooklyn Borough Gas Co., Raps for Order

BROOKLYN UNION MEN HOLD COMPANY DINNER

A Large Delegation Is Attending the Convention

The delegation of the Brooklyn Union Gas Company is here again a trifle larger than last year. The familiar blue badges are seen along the Boardwalk in increased numbers. The delegation is active in all of the sessions of the convention, the representatives taking part in the various discussions.

The representatives of the company were all here Monday evening. At 7 o'clock the company dinner was held in the Belvidere Room of the Hotel Traymore. The affair lasted until midnight. There was dancing all evening.

At the end of the dinner short addresses were made by the two vice-presidents of the company, Arthur F. Staniford and Clifford E. Paige.

Among those at the dinner were Mr. and Mrs. C. C. Aspinwall, Mr. and Mrs. E. J. Bartell, Mr. and Mrs. J. I. Blanchfield, Mr. and Mrs. C. E. Cheeseman, Mr. and Mrs. J. P. Conklin, Mr. G. S. Cremer, Mrs. J. M. Cremer, Mr. and Mrs. F. W. Fitch, Mr. and Mrs. G. L. Hallock, Mr. and Mrs. George M. Kirchmer, Mr. and Mrs. A. C. Klein, Mr. and Mrs. E. B. Lawrence, Mr. and Mrs. J. S. MacArthur, Mr. and Mrs. T. P. Payne, Mr. and Mrs. W. H. Percival, Mr. and Mrs. C. J. Roeser, Mr. and Mrs. E. J. Shields, Mr. and Mrs. Arthur F. Staniford, Mr. and Mrs. Robert Staniford, Mr. and Mrs. L. S. Stiles, Mr. and Mrs. E. C. Uhlig, Mr. and Mrs. John H. Waldron, Mr. and Mrs. Charles A. Young, Mrs. Kathryn Leonard, Miss S. Beckler, Miss Grace Etter, Miss Betty Hillebrecht, Miss Marie Kelky, Miss Ruth Soule, Miss F. H. Woishek, C. C. Atwood, O. J. Amuller, H. Behrman, W. Bishop, M. E. Brown, R. W. Bush, E. L. Byrne, H. C. Canno, C. O. Chichester, C. P. Cornell, F. F. Coleman, W. M. Cunningham, M. O. Davis, E. J. Devlin, J. C. Devlin, W. R. Orachbar, John J. Garland, A. R. Gledhill, C. E. Goldsmith, C. S. Goldsmith, Arthur Hansen, H. M. Harriman, J. F. Howley, Jos. Jares, H. R. Jesper, E. D. Jones, Rufus King, H. P. Kirkman, E. A. Koster, W. W. Kunze, E. H. Marsh, F. A. May, T. B. J. Markt, E. J. Murphy, E. L. Nickerson, Clifford E. Paige, Alva Palmer, J. W. Platt, J. P. Quinn, F. M. Roesch, W. F. Smith, J. P. Stagg, F. D. Tansey, R. B. Underhill, A. J. Voorhees, C. W. Waddington, Herbert Wellington, Prescott B. Wiske, Frederick Wogan, T. P. Shea and W. T. McDonald.

The company maintains headquarters on the balcony of the Steel Pier, where all information can be secured.

F. S. Wade
Southern Counties Gas Co., Los Angeles, California

Variety Of Subjects Interest Commercial Men

Second Meeting Devoted Mainly To Architect Relations and Sales Questions

The Commercial Section of the American Gas Association yesterday afternoon at 2 o'clock in the ballroom on the ocean end of the Steel Pier.

Chairman James P. Hanlan

R. M. Connor
Director A. G. A. Testing Laboratory

called the meeting to order and followed immediately with an introduction of Ralph M. Connor, director of A. G. A. Testing Laboratory, Cleveland, O.

THE TESTING LABORATORY

Mr. Connors gave a brief, but interesting, discussion on the development of the laboratory. The laboratory, he stated, will supply the drastic need of insuring the safety and thorough dependability of gas appliances. It is not a passing fancy but the fruit of serious thought, of which intensive study was begun as early as 1915. He mentioned gas ranges as the first appliances to be tested. Two important points of the laboratory's work, stressed by Mr. Connor, were the standardization of construction methods and the elimination of all danger in the use of gas appliances. This, he stated, should greatly increase the demand for gas appliances. The laboratory is in its infancy, but it is slowly and surely filling its important position in the gas industry, and already there is a greater sale of those appliances O. K'd by the laboratory than of those unapproved.

H. C. Abell, the President of the association, then took the stage and spoke briefly on the great possibilities of co-operation between the gas industry and the architect. Another point stressed was the rapid progress in house heating. The Commercial Section, he averred, was most progressive and instructive and added materially to the welfare of the gas industry.

The next speaker was Secretary-Manager, Major Alexander Foward. He spoke on the laboratory work at Cleveland, on the work of the Committee on Relations with Architects and Builders, and on Home Service, as important factors in the gas industry. "Home service work, in particular," he stated, "got in close touch with the women of the nation, and accomplished an infinite amount of good in the promoting of gas." In concluding he made a plea for wide-reaching vision and constructive imagination in the gas industry.

R. L. Burdick, Secretary of the Commercial Division, was next on the program. He talked briefly on the definite progress of salesmen and the excellent work of the newly organized Regional Sales Council.

CO-OPERATION OF ARCHITECT AND GAS MAN

The next address was by S. F. Voorhees, Chairman, Committee New York Chapter, American Institute of Architects, a well-known New York architect, who gave an interesting and instructing talk on the co-operation of the architect and the gas man. "Gas, for cooking," he said, "was ideal but, up to the present time, it has not been so extensively used for general heating purposes." He particularly stressed

R. H. Maurer
V. P. Automatic Safety Appliances Corp., New York, N. Y.

the erection and location of flues in houses using gas heat.

Mr. W. A. Adams, Chairman of the committee, then addressed the meeting, taking as his topic, "Selling Gas to Architects." He stated that a 50 per cent. increase in sales was expected within three years. Three important factors who influence the amount of provision for gas in a home he listed as: Architects, Builders and Contractors and Home Owners. He also spoke on the study of means and methods, company promotion efforts and public education. He recommended that

the investigation of the "Master Meter" plan be carried on and that some means be devised by which manufacturers of gas appliances will supply standard data sheets for the use of architects and for insertion in the architect's file folder.

PROPER FOUNDATION FOR USE OF GAS

In conclusion Mr. Adams said, "this committee feels that one of the greatest single factors that will influence the future of the gas industry, lies in the proper foundation for the use of gas; and surely there is no better time to lay that foundation than when a building is contemplated. We have been engaged in this work long enough to know that it is not an experiment, we know from those that have the service that it is working very satisfactorily, and we suggest to every member

The Pioneer of Home Service Work,
Mrs. Anna J. Peterson
Peoples Gas Light & Coke Co., Chicago, Illinois

company of the A. G. A., its adoption."

REFRIGERATION WITH GAS

Mr. H. D. Valentine spoke next on "Refrigeration With Gas," listing the A-B-C's of mechanical refrigeration and giving the two types of refrigerating systems, namely, the compression system and the absorption system. He spoke instructively on the characteristics of the refrigerating load and its relation to the heating load, and informed his audience of two new appliances, soon to be on the market, that will practically revolutionize gas refrigeration. Referring to his treatise on "Gas Refrigeration" Mr. Vantine added, in closing, that he hoped next year, to add a

Chas. A. Luther
Asst. Gen. Mgr., the Peoples Gas Stores, Chicago, Illinois

great deal more to this, amounting almost to a Handbook on Gas Refrigeration.

HOUSE HEATING

E. P. Bailey, Jr., Chairman of the House Heating Committee, spoke next, his topic being "Progress in House Heating." "In an appreciably short time," he stated, "the number of companies engaged in selling gas for house heating had risen from 50 to 128. He told of the building of a sales organiaztion and favored the use of college men on the sales force, as having the realization of what comfort and convenience mean, and of being able to impress this on prospective buyers.

SELL THE "GAS"

"In selling gas house heating,"

William Gould
Commercial Manager, Gas & Electric Improvement Co., Boston, Mass.

he said, "sell the gas, not the appliance; sell the service, not the stove or heater!" The gas companies cannot do it all, Mr. Bailey told the section, but must have the co-operation of the architect and the house contractors. "Take proven equipment from the market and apply them to your own conditions. You will be making no mistake," Mr. Bailey informed them. "In the future we are looking for 25 per cent. of the nation's heating," he said in closing.

THE SALES QUOTA

Mr. William Gould, Commercial Manager, Gas & Electric Improvement Co., Boston, Mass., next addressed the meeting on "Sales Quotas." He discussed the importance of the sales quota of the gas company, and told about the results that have been obtained in New England along these lines. He said that it had been found to be of very definite help to various New England companies who had made use of the sales quota, in increasing sales of gas ranges and tank water heaters.

He said, "Set a sales quota and you may buy and sell appliances without fear of any criticism. "Sales quotas not only tell you

where you should go, but how you are progressing all through the year."

ADOPTION OF SALES QUOTA URGED

In concluding his talk he said, "We therefore wish to bring up for discussion this subject with the hope that a sales quota will be adopted by the Commercial Section for the coming year and are offering as reasons for its adoption:

1. That it will stimulate and abet the Sales Stimulation Committee's efforts.

2. That a sales quota has increased sales wherever used.

3. That a standard, or quota, is being used in every other department of the gas industry.

4. That it is constructive and progressive in its ideas and results.

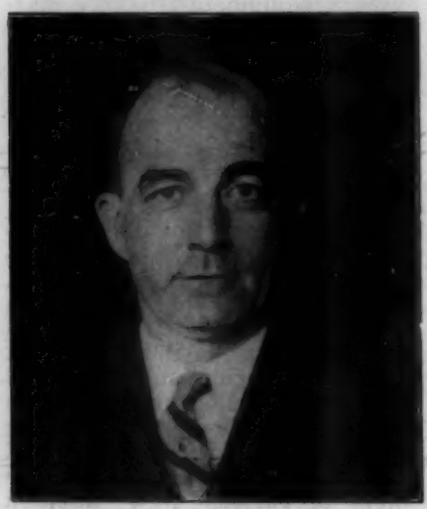
5. That while it is not a panacea for all sales troubles, it is a sensible and logical up-to-date means of planning one's work with the hit and miss eradicated.

I trust that some action will be taken by the Commercial Section and I welcome, at this time, any discussion or questions."

Accountants Listen To Interesting Papers

Second Session of Accounting Section Devoted to Various Matters

The second session of the Accounting Section, which was held at Haddon Hall yesterday afternoon, was devoted to a discussion of a variety of subjects. It was



John J. Blanchfield
Asst. Auditor, Brooklyn Union Gas Co., Brooklyn, N. Y.

a well attended and a very busy meeting.

The first business on the program was the report of the Committee on the Analysis of Gas Company Statistics, which was presented by the chairman, H. J. LaWall, statistician, United Gas Improvement Co., Philadelphia, Pa. Mr. LaWall commented on the growing demand for statistical information by public utility managements and others, and described the work of his committee, which was organized last year. The principal subject subject that was considered by the committee was "The Value of Statistics as Applied to Gas Sales, Revenue and Costs. The work of the committee was divided into two parts, one concerned with the development of a cost system for gas companies and the other concerned with the standardization of questionnaires.

COST SYSTEM FOR GAS COMPANIES

The sub-committee which was concerned with this phase of the statistical problem reported through its chairman, R. H. Knowlton, the United Gas Improvement Co., Philadelphia, Pa. Mr. Knowlton went into a discussion of the necessity of a refined cost system in the gas industry and described the various elements that are involved in such a cost analysis.

The second part of the committee's report was presented by the chairman of the sub-committee on Standardization of Questionnaires, G. S. Cramer, chief accountant, Brooklyn Union Gas Co., Brooklyn, N. Y. Mr. Cremer said that the questionnaire evil has grown to such huge proportions in the course of the American business man's thirst for information that it is seriously interfering with the prosecution of his business.

A. S. Goldsborough
Baltimore, Md.

"Some people think that every gas man belongs to an old Oriental fraternity called the Li Li Kel Club," Mr. Creme said. "As a matter of fact, every large gas company has to sacrifice each year about a whole month of the time of one of its best accountants in giving careful and accurate answers to some fifty odd questionnaires sent to it by seekers after information, ranging in importance from departments of the Federal Government to college students gathering material for class-room essays.

"Answering questions truthfully in the way in which they are put is something equivalent to telling a lie," said Mr. Cremer. "Giving a correct answer is not enough; we must be careful also

to give a correct impression, even though that care forces us to refuse to answer a question in the way in which it is put."

Mr. Cremer said that standardization would not only save labor, but would increase the probability that the information given would be both correctly stated and correctly used.

THE PUBLIC UTILITY PURCHASING AGENT

The next speaker on the program was J. M. Knowles, of the Consolidated Gas Co., of New York City, whose subject was the Public Utility Purchasing Agent. Mr. Knowles discussed the duties and analyzed the work of the purchasing agent in the gas and other utility industries. He traced the development of the purchasing agent from the stage when it was the duty of some employe, who had other work to perform as well, to make purchases for the company, to the present time when the purchasing agent is a necessary member of every large organization. We went into a detailed description of all the various functions that constitute the work to the utility organization. Special attention was devoted to the purchasing of printing.

INSURANCE COMMITTEE REPORTS

The next business on the program was the report of the Insurance Committee, which was ma dethrough its chairman, J. G. Reese, the Consolidated Gas Electric Light and Power Co., of Baltimore. Mr. Reese stated that the work of the committee during the past year had been concerned with the following matters:

1. Further adoption and application of the new rating schedule and the inherent explosion clause.

2. Preparation of suggested standard forms to be attached to fire policies governing gas properties.

3. Aiding member companies to obtain reductions on liability policies.

4. Further consideration of insurance covering damage to property of others, known as property damage.

5. Study of group life insurance.

6. The preparation of an insurance primer or an explanation of the various classes of insurance in a manner easily understood by the layman.

7. Service to member companies on various problems relating to insurance of all classes.

In conclusion, Mr. Reese said: "An awakening interest in insurance problems and fire prevention has proved beneficial to many of the larger companies and it can be of considerable more value to the smaller companies . . . Careful attention to insurance and fire prevention will well repay any company as is indicated by the increasing number of organizations which have delegated such work to some individual reporting to an executive.

C. A. Jefferis
Gen. Supt. Consumers Gas Co., Toronto, Canada

The report contained a number of examples of standard insurance forms and described changes therein of advantage to the gas company.

This report was followed by the reading of a report on Uniform Classification of Accounts, which was presented by the chairman, W. J. Meyers, United Electric Light and Power Co., New York City.

The meeting then adjourned until Thursday afternoon.

GAS COMPANIES AND MANUFACTURERS MUST WORK TOGETHER FOR INDUSTRIAL LOAD

The representative of the Journal found Arthur M. Apmann, chairman of the Progress Committee of Industrial Gas Section for the Eastern States with two things weighing heavily on his mind.

"The gas companies are beginning to realize," said Mr. Apmann, "that industrial appliances must be sold in order to increase the gas load, and that new merchandising methods are necessary in order to sell industrial appliances. The function of the gas company in selling these appliances is to prepare the way for factory specialists. The gas company must secure the confidence of the prospect in gas and the possibilities of gas. Through mutual local interests, this should be easy. Once the prospect is sold on gas, the way is ready for the appliance manufacturer, and the specialist arrives and goes over the situation with the prospect, talking to him in his own language on his own problems, and the sale is made. It is not fair to expect the gas companies to foot the expense of these specialists, nor could many of them afford to do so.

"Industrial appliance manufacturers," continued Mr. Appman, "are glad to furnish these specialists themselves. They send men who know their subject thoroughly, men who have the inside information on the prospect's business at their finger tips, who can see at a glance what is needed. The tendency of business is towards organization and specialization, and it is only to be expected that the gas companies and the industrial appliance manufacturers should begin to cast about for ways of apportioning their work. The share of preparing the grounding, of building the foundations, then, falls to the gas company, and of

completing the structure to the specialists from the factory."

There are forty-five men on the Progress Committee and only about a hundred reports have been turned in for the past year. Mr. Apman issues a plea for more reports. It is only by keeping in touch with public demand through the reports sent in by the individual gas companies that the gas appliance engineers are able to improve their products in accordance with good selling principles. The gas company usually knows what the public wants. If this information is rendered available to the whole industry, the manufacturers will attempt to supply the demand and thus increase the gas company business.

THE USE OF COPPER IN WATER HEATERS

H. J. Long, president the Kompak Co., in recommending quality goods as giving lasting satisfaction had the following to say when interviewed today by the American Gas Journal reporter:

"I have just received in the mail, a copy of Volume II of the A. G. A. Service Plans, and on the third page is a chart with the word Quality at the very top, referring to both quality of appliance and quality of service. This word Quality typifies my efforts in promoting the use of copper and brass exclusively in the water containing units of gas water heaters.

"This decision was arrived at after years of experience, I might say costly experience, in trying to make price a basis of selling, rather than quality. My experience should be a beacon to gas merchandisers everywhere, to avoid the pitfalls of inferior quality, and to start now and merchandise only water heaters so constructed that they can be sure of years of satisfied use.

"Up to the present time there is only one metal which will absolutely prevent rust or corrosion in a water container, and that is copper. This fact is known to the public through years of experience with galvanized iron range boilers, with the result that copper carries with it an assurance of quality which is unquestioned. The purchaser knows that he is securing the best and thus the higher selling price is immediately justified.

The marketing of high priced, quality goods, is perhaps more difficult than where sold on price, but the lasting satisfaction to the customer, the inspiration which comes from selling a quality product, more than makes up for the slight additional effort."

Pure Gas the Goal

C. J. Ramsburg Describes Important Investigation On Gas Purification

The Koppers Company research and operating sections are working on two phases of gas production, namely, a lower cost of production embracing lower capital costs, as well as operating costs: and, the production of a pure gas of uniform character and quality. With reference to the second phase "purity," we have been making marked progress.

We believe that within the next twelve months we will be able to so treat coal or water gas that it will be free from cyanide, sulphuretted hydrogen and all other sulphur compounds; naphthalene, condensible hydro-carbons, condensible water vapor and also all gum-forming constituents.

We believe that in the working out of these operations efficiently and cheaply that we will have accomplished a great deal to increase the use and sale of gas, as well as to cut down enormously the cost of mains and their maintenance, including meters.

The plant for efficiently removing sulphuretted hydrogen by the liquid process, including the recovery of the sulphur as a by-product, has recently gone into operation most successfully.

We have recently put into operation at our Seaboard company's plant a very efficiently operating unit which removes at almost no cost the naphtalene, heavy hydrocarbons and the gummy resinous bodies.

This type of plant will be offered to the gas business at once on a commercial scale in all sizes.

The gas business could wake up truthfully every morning and say with Mr. Coue, "Every day in every way we get better and better."

Are Gas Companies Making The Most Of Their Opportunities?

R. W. Rogers, Manager of Gas Range Sales, Sterling Range and Furnace Corporation, emphasizing importance of performance rather than price in gas appliances, had the following to say to our reporter:

"Gas appliances for domestic cooking sold by the gas companies and gas appliance dealers, during the past season, from my observation, has savored of but one outstanding feature—price, it seeming as though it were a contest to see who could sell the cheapest, forgetting the real opportunity that recommending the right kind of apparatus holds.

"Are the appliances recommended by the gas companies the kind that will create more home cooking? Or are they simply a part of the kitchen furniture?

"Are the gas companies con-

(*Continued from page* 396)

The theme of his discourse can perhaps be summed in the phrase "The relation of advertising to service." He said:

"All good advertising renders some service to some one. The

J. S. S. Richardson
Director Pennsylvania Committee

amount varies all the way from the little lost and found ad that is important to only one person in the world to the advice on health and diet broadcast by a great insurance company to millions of people through full pages in our national magazines.

"Highest of all in technical value are those advertisements that teach us how to live more comfortably, economically and intelligently. Among these the most conspicuous examples of recent years have been the advertisements used for a whole industry, such as paints, citrus fruits and

S. T. MacQuarrie
Director New England Committee

public utilities, like gas and electric light. Some conspicuous examples are also found in the advertisements of private corporations that nevertheless serve the interests of the entire industry.

GREAT BENEFIT TO THE READER

"Such advertising is not altruistic, of course, but the benefit to the advertiser is sometimes far less important than the benefit to the reader, and comes only after the reader—the consumer—has reaped his personal reward."

ACCIDENT PREVENTION

In the early part of the meeting, Charles B. Scott, chairman of the Accident Prevention Committee, briefly outlined the work of his committee during the past year, and also told in some detail of the co-operation extended by the National Safety Council. To prevent industrial accidents, Mr. Scott gave three precepts that should be exercised in every plant. They are as follows: (1) insist on proper selection of employes; (2) insist on proper instruction of employes in their duties; (3) exercise close and proper supervision of the work.

The concluding minutes of the session were devoted to a formal presentation of the McCarter and Beal medals, and to a reading by the secretary of the names of Association members who had died the past year.

(*Continued from page* 398)

JOE CARMICHAEL ON NEWSPAPER CONTACT

"The newspaper is the principal medium for the circulation of facts and figures and ideas, from a consideration of which the 120,000,000 people of this country form what is known as public opinion," declared Joe Carmichael, director of the Iowa Committee, in his address entitled "The Newspaper Contact—How It Is Accomplished—What Is Its Value."

"When publishers understand that utilities are not seeking something for nothing, but expect to pay for legitimate service, a firm foundation has been established on which to form a cordial contact with the men who direct the channels through which news flows," he went on.

"The newspapers had to be shown that they were being asked only to print news and that whatever there was in the nature of advertising or plain propaganda would be placed in the advertising columns and paid for.

UTILITY PLAYING FAIR

"And the utilities are playing fair with the newspapers in this respect. In our state (Iowa) practically every one of the larger util-

H. M. Lytle
Assistant Director Illinois Committee

ity companies and most of the smaller ones advertise constantly and consistently their service, their appliances, and their securities, and supplement these with an explanation of their organization and their problems.

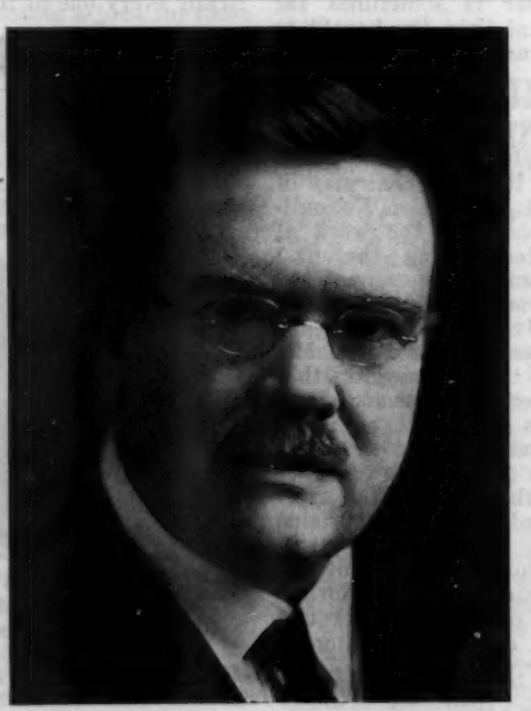
"The spirit of confidence in a news source spreads among newspaper men. They have their con-

J. B. Sheridan
Director Missouri Committee

ventions and conferences just as we do in the utility business. And they always discuss the press bu-

reau no matter what else the conference may have been called to discuss.

"And when you get to the point where, after damning the press agents for two hours and resolving against them and promising not to publish a line of their stuff, they will say, 'But this utility information bureau is all right, they play the game squarely,' you have arrived some where.



B. J. Mullaney, Vice Pres. Peoples Gaslight & Coke Co., Chicago, Illinois, Director Illinois Committee

Mr. Carmichael went on to a discussion of the ways in which the information bureau could aid the papers and impressed the point that fair dealing was the basis of any future good relations between the utilities and the newspapers.

Preparation of information of every sort by expert authorities, full information of consolidations, the correction of mis-information arising from other sources, the allaying of discontent on the part of the public, were some of the methods the speaker outlined for assistance to the newspapers.

PROMOTING GOOD RELATIONS

Other speakers told of the promotion of good public relations with the public, by addresses throughout the territory served, by free moving pictures, by direct-mail information and the like.

B. J. Mullaney, director of the Illinois Committee, declared that public relations included every contact the utility made with the outside world, and with employes as well. His talk explained how the Illinois Committee, earliest in the field, functioned, gathering information, making positive its accuracy and then disseminating it.

When an information bureau departed from its best work, that of the dissemination of real information, and began to propagandize, with a distortion of the facts, he warned, it was up on its way to its own downfall.

PREPARING COPY

S. T. MacQuarrie, director of the New England Committee, declared it was essential to prepare matter so that editors would not throw it in the waste basket, and so that the editor would gain such confidence in the utility that he would depend on it as a source of information.

The type of editor to be contended with, the man who felt that a good circulation boosting stunt would be to be continually firing at the public utility with the ostensible purpose of benefiting the reading public, was also spoken of.

OTHER SPEAKERS

J. B. Sheridan, director of the Missouri Committee, spoke of fundamental work done in the educational field, and was followed by H. M. Blain, of the Louisiana-Mississippi Committee, speaking on "Educational Work of the State Committees," and E. F. McKay, director of the Oklahoma Committee, who told of the public speaking work in his state.

Other speakers were H. M. Lytle, vice-president of the Chicago Rapid Transit Company; W. P. Strandborg, director of the Oregon Committee; George McQuaid, director of the Texac Committee, and S. E. Boney, director of the North and South Carolina Committee.

Chairman F. L. Blanchard of the Publicity and Advertising section of the A. G. A., presided over the meeting, which was held under its auspices, and will occupy the chair again today when the second session of the national conference is held in the same place.

J. C. Hellett
Director Indiana Committee

The Future Of Industrial Gas

Charles C. Krausse Says Increased Manufacturing Efficiency and Efficient Appliances Are Important Factors

One cannot very well discuss the future of industrial gas without beginning with the past and then considering the present, in order to develop the future in a logical manner. It is true that the Industrial Gas Industry is very, very young, hardly more than one and a half decades at the most, but nevertheless, it is old enough to have a past. Of course, we all know that this youngest offspring of the old gas industry has a very vigorous present and we are confident that it will grow to a gigantic size in the future.

The past I think is best characterized by the word "crude." We essayed many heating operations, but one can safely say that in 99 cases out of a hundred, the burners or the furnace or something connected with the utilization of gas was crude. At the same time, we were competing with low-priced fuels and had no special industrial rates for the sale of gas. As one looks back, he marvels that we secured as much business as we did.

GRADUAL EVOLUTION

There was a gradual evolution in these things, most of which occurred within the last five years. This period, which I call the present, is characterized by more efficient apparatus, keener competition from other fuels and a tendency to classification of heating operations which can be done economically by gas. Among the more efficient apparatus we have, several satisfactory combustion systems, well built and well insulated furnaces and ovens, accurate temperature controls and some specialized heating machines which combine these characteristics with suitable material handling machinery. There is little doubt in my mind but what we have been meeting competition which has been gradually getting keener. I refer to that competition due to the low price of both coal and oil in the past couple years and to the competition which is the result of very high quality salesmanship. This latter form of competition we have had for some time from our electric friends and now at least in some sections of the country, the oil and coal industries maintain technical sales and service organizations comparable with those of the gas companies.

CLASSIFICATION OF INDUSTRIES

The classification of industries as regards use of industrial gas, is somewhat difficult from a national viewpoint, but I think that while

Charles C. Krausse
Ind. Gas Engineer,
Baltimore, Md.

this classification will differ in various parts of the country, there will be a tendency toward a relative classification in all parts. For instance, it seems to me that in the part of the country with which I am most familiar, it is relatively easy to secure what I call low-temperature operations, such as cooking, baking, coffee roasting, lithographing, tin can manufacturing and the like. Also I find those industries which use relatively small amounts of heat on each of many different appliances but whose total fuel requirements are considerable, to be likely customers. Of course, if the total fuel bill is not large, any industry is a probable customer. I do not mean that the former classifications include all possible industrial gas customers. I know of many which fall into neither of the previous classifications, some which have very high gas consumptions for operations varying from 1500 to 2500° F, but I find that there are as a rule some special conditions which make the use of gas here economical for the customer.

FUTURE DEPENDS ON OURSELVES

The future of industrial gas depends to large extent upon ourselves, but we are not independent of the gas manufacturing men. Regarding competitive fuels it does not seem probable that we shall in the future face cheaper oil or coal than at present. We may find electricity somewhat cheaper but it is not probable that this will be very much lower than it now is. However, we shall face much more intelligent and better qualified sales organizations. It is therefore essential that we also build, improving the calibre of our personnel. I have no doubt that there will be continued improvement in our appliances for industrial gas. If we have the ability to sell the jobs, the manufacturers will develop equipment as rapidly as the market permits them and still operate at a profit. I look for improvements in the way of recuperators and heat controls particularly. I might say here, that it is absolutely essential that we sell installations incorporating the most efficient apparatus, including temperature controls, regardless of the difficulty of selling the customer on a large first cost. Such installations will be the only ones which will permit us to win over cheaper competitive fuels. So far I have said nothing of the scope of the business, we may expect to get in the future. This is dependent not alone upon ourselves, but upon our manufacturing brothers. If such improvement can be made to give us a materially lower priced B.T.U., the industrial men will get the business and Industrial Gas will truly become "The Industrial Fuel."

tributing constructive suggestions to the manufacturer of gas ranges that will arouse an interest to produce ranges that will really do better broiling, better baking, and better cooking?

"If not, they are forgetting the real object for which they recommend gas appliances, that of increasing the consumption of gas by its genuine superiority, as compared with other fuels.

"Has this important fact been relegated to the rear instead of being the one most outstanding?

"Have the manufacturers of gas ranges been made to feel that their only opportunity to secure a portion of the gas companies' business will be measured by the prices they are able to quote, rather than quality of construction, or high standard of performance?

GAS FOR DOMESTIC COOKING

"Gas for domestic cooking is without doubt the most convenient and economical fuel, and is only restrained from winning the highest favor from its users by the cheap and inefficient apparatus through which it has to serve.

"The opera singer's voice is just as pure and sweet when accompanied by a cheap and inferior instrument as when accompanied by the most perfect made. But the listening public is unable in the majority of cases to recognize the fact, and so the greater the singer the more apt are you to find the accompaniment that of instruments of the highest standard and quality. For the popularity attained by the singer is attained by the rendition as interpreted by the public, no allowance being made for the discord or lack of harmony due to the use of interior instruments.

"Just so with gas, its cleanliness, power, convenience and economy are fixed qualities; still there are hundreds of users yet to learn this, because they have measured its value through the operation of cheap and inefficient apparatus.

GAS COMPANY THE STANDARD

"The gas company in every community is the standard by which the people measure the type and kind of apparatus best suited for their needs, and while they may not always buy from or have the apparatus installed by the gas companies, their decision is largely made by comparison with the kind of apparatus the gas company recommends.

"Right here it seems to me is a real opportunity—one that will do more to popularize and promote the use of gas than any one other method.

"This opportunity should be for the gas company to make its purpose in the community which it serves a high one, that of honestly advising the use of apparatus best suited to the needs of the people, the kind that will allow the full value of gas as a fuel to be measured by performance and establish good will that will automatically remove that great evil that now exists—the selling of PRICE—instead of — PERFORMANCE."

FROM THE DIARY OF A GAS MAN

Recollections by T. H. Hintze of Early Days at Malden & Melrose Gas Light Co.

It was the first Monday in January of 1887 that I came to work at the plant on the location of the present one and my entrance into the gas business. Had been given the position of a foreman. It was a job of many varieties and as time passed they seemed to increase. From cleaning pitch out of the hydraulic main to reading meters and delivery of bills, with all numerous items of service work in between.

T. H. Hintze

The first job every morning, rain or shine, was a drive to the outside holders in Medford and Melrose, reporting their contents to the superintendent on return. At times there would be nothing to report, as there was no gas in the holders. It was not an uncommon occurrence to find one of themflat and upon returning open the outlet valve of the holder to fill it. Sometimes the case was reported that the "gas would not light," but there was never any serious trouble caused by either of the outside holders being empty.

Gas at that time was used wholly for lighting and competition from electricity was not a menace. Gas ranges were a novelty and just beginning to come to the attention of the public. Eight-hour days were unknown and vacations were only for school children. Retort house men were on a 12-hour day at 2.00 per day, and upon changing to night work every two weeks put in 24 hours.

For five long years I worked and had a part in all phases of the business. It seemed to me the more work I performed the more was necessary and what authority I assumed was never questioned. Subject to call every hour of the 24, have very often spent the entire night on some repairs. It was a part of the job to report at the plant every evening, including Sunday until 9 and then leave for home and gamble whether you would sleep the night through, or have a call to adjust some trouble at the plant. I can readily recall a ring of the door bell, and upon raising the window, a voice in Celtic tones, audible to the neighbors, "Come hurry down to the Gas Works the gas is burning blue," or "We cannot keep steam up in the boiler," at divers times it was "John is drunk again and fighting the whole gang." All was taken as a part of the business.

Some Views of Atlantic City, Where the Seventh Annual Convention of the American Gas Association is Being Held

Registration of A. G. A. Members up to 5 P. M., Oct. 14th. List of Guests registered can be found in Booth 510-B on Steel Pier.

A

Adams, Wm. P.; Millville, N. J.
Addicks, W. R.; New York City; Brighton
Addis, E. M.; Wallingford, Conn.; Marl.-Blen.
Allebach, Wilmer K.; Camden, N. J.; Dennis
Allen, Walter Fox; Newark, N. J.; Ambassador
Anderson, John C.; Elizabeth, N. J.; Haddon Hall

B

Bair, E. E.; Hanover, Pa.; Traymore
Baker, Henry N.; Yonkers, N. Y.; Wiltshire
Baldwin, C. Kemble; New York City; Traymore
Ballard, Roscoe F.; Chester, Pa.; Ambassador
Barrington, Walter D.; New York City; Traymore
Bartlett, C. E.; Philadelphia, Pa.; Franklin
Battin, H. W.; Camden, N. J.; Dennis
Baxter, Lewis; New York, N. Y.; Knickerbocker
Bean, Philip H.; Jersey City, N. J.; Strand
Beatty, I. M.; Ossing, N. Y.; Dennis
Benz, Herman; Paterson, N. J.; Haddon Hall
Bimson, Jr., John; Paterson, N. J.; Dennis
Black, Jr., W. H.; Jersey City, N. J.; Ambassador
Bogie, Robt. R.; Brooklyn, N. Y.; Traymore
Bruce, Lincoln W.; Yonkers, N. Y.; Traymore
Buck, Jr., George V.; Philadelphia, Pa.

C

Carkeek, Harvey T.; Philadelphia; Strand
Carney, Thos.; Philadelphia, Pa.; Holmhurst
Carpenter, H. S.; Newark, N. J.; Ambassador
Carson, Harry Y.; Birmingham, Ala.; Brighton
Cassell, W. H.; Baltimore, Md.; Traymore
Christie, A. G.; Baltimore, Md.
Clement, Millard F.; Middletown, N. Y.; Traymore
Coate, P. S.; Chatham, Ont., Can.; Breakers
Coffman, E. Foster; Camden, N. J.; Dennis
Colquhoun, E. M.; Middletown, Pa.; Breakers
Cortelyou, G. B.; New York, N. Y.; Brighton
Craymer, Frank W.; Philadelphia, Pa.
Creeden, Dan'l F.; New York City; Knickerbocker
Creely, Geo. L.; Somersville, N. J.; Strand
Cushing, Thomas E.; Chester, Pa.
Cuthrell, Hugh H.; Brooklyn, N. Y.; Traymore

D

Damon, Roger H.; Newark, N. J.; Ambassador
Davey, Robert; Jackson, Mich.; Ambassador
Davidson, Kenneth H.; New York City; Marl.-Blen.
Davis, Jr., E. S.; Philadelphia, Pa.; Ambassador
Davis, W. I.; Jenkintown, Pa.; Ambassador
Davis, W. Irving; Jenkintown, Pa.; Ambassador
Dean, Jos. F.; Poughkeepsie, N. Y.; St. Charles
Deegan, Wm. A.; New York, N. Y.; St. Charles
Deierlein, Edward; Portchester, N. Y.; K. of C.
Detjen, Harry M.; New York, N. Y.; Brighton
Dennis, Christopher; Newark, N. J.
Denton, Chas. C.; Elizabeth, N. J.; Strand
Detweiler, C. A.; Pittsburgh, Pa.; Traymore
Dill, John H.; Baltimore, Md.; Strand
Dillon, Mary; Coney Island, N. Y.; Chalfonte
Downing, John W.; Salisbury, Md.
Downs, Fredk. D.; Derby, Conn.; Mor[illegible]
Drexler, N. E.; Newport News, Va.; [illegible]
Duke, Arthur S.; New York, N. Y.; Knickerbocker

E

Ebbecke, Wm. H.; Philadelphia, Pa.; Traymore
Erlach, Paul A.; Hammond, Ind.; Traymore
Evans, O. A.; Philadelphia, Pa.; Norumbrega

F

Fairfield, Clifford L.; Boston, Mass.; Traymore
Farley, John T.; New York, N. Y.; Knickerbocker
Farrand, Dudley; Newark, N. J.; Ambassador
Flor, A. W.; New York, N. Y.; Chalfonte
Fisher, Frank J.; Bronx, N. Y.; Traymore
Folger, O. H.; Hackensack, N. J.; Strand
Foster, Geo.; Brooklyn, N. Y.; Traymore
Friedman, Arthur; Cleveland, Ohio; Traymore

G

Galt, James H.; Trenton, N. J.
Ga Nung, H. D.; Phila., Pa.; Seaview Golf Club
Gardner, P. D.; Bayonne, N. J.; Haddon Hall
Gatchell, Frank B.; Baltimore, Md.; St. Charles
Gilbert, Geo. L.; Fall River, Mass.; Traymore
Goodwin, Fred M.; Boston, Mass.; Chalfonte
Graham, F. G.; New Rochelle, N. Y.; Strand
Green, Albert; Philadelphia, Pa.; Strand
Gribbel, John; Philadelphia, Pa.; Traymore
Grimes, L. E.; Boring, Md.; Brighton

H

Habfast, Charles; Burlington, N. J.; Dennis
Haby, H. E.; W. Hoboken, N. J.; Knickerbocker
Hamilton, F. C.; New York City; Ambassador
Harvey, Wm. John; Paterson, N. J.; Ambassador
Heckman, Jos. C.; Noblestown, Pa.; Traymore
Heuser, Wm. L.; Newark, N. J.; Brighton
Hicks, Harry J.; Norfolk, Va.; Palm Hall
Hirst, Homer T.; Chicago, Ill.; Ambassador
Hobbis, Thos. R.; E. Orange, N. J.; Marl.-Blen.
Hones, Chas. J.; Baldwin, L. I., N. Y.; Breakers
Housel, Jas. L.; South Amboy, N. J.; Haddon Hall
Howell, Alfred E.; Somerville, N. J.; Traymore
Hutchins, Henry; New York City; Knickerbocker
Huth, Harry M.; Baltimore, Md.; St. Charles

J

Johnes, Ralph E.; Chester, Pa.; Knickerbocker

K

Kay, Frank L.; Yonkers, N. Y.; Morton
Keys, Harvey A.; Pittsburgh, Pa.; Marl.-Blen.
Kindley, Geo. F.; Washington, D. C.; Breakers
Klein, A. C.; Boston, Mass.; Ritz-Carlton
Knox, R. S.; Long Branch, N. J.; Ambassador
Krick, K. C.; Columbus, O.; Traymore

L

LaWall, Harold J.; Philadelphia, Pa.; Ambassador
Larson, Erick; Islip, N. Y.; Chalfonte
Lueders, C. J.; Lynn, Mass.; Marlborough-Blen.

M

McCabe, Walter S.; Wilmington, Del.; St. Charles
McCann, Thos.; New York, N. Y.; Knickerbocker
McOwan, E. D.; Jersey City, N. J.; Knickerbocker
MacSweeney, Jos. P.; Rochester, N. Y.; Strand
Macomber, Alex.; Charlestown, Mass.; Haddon Hall
Manier, R. W.; Binghamton, N. Y.; Knickerbocker
Mant, Lionel A.; Newark, N. J.; Strand
Marks, A. A.; Philadelphia, Pa.
Martin, Chas. E.; Gardner, Mass.; Chalfonte
May, Frank A.; Brooklyn, N. Y.; Haddon Hall
Messmore, Geo. E.; Kenkintown, Pa.
Mickle, J. E.; Media, Pa.
Milener, Eugene D.; Galtimore, Md.; Dennis
Morgan, Chas. S.; Rochester, N. H.; Breakers
Morrison, Henry K.; Lynn, Mass.; Brighton
Myers, Chas. S.; New York; Chalfonte

N

Nichols, C. B.; Philadelphia, Pa.; Brighton

P

Parkhurst, G. W.; New York, N. Y.; Haddon Hall
Palmer, Robt. H.; Port Chester, N. Y.; Traymore
Payne, Christy; New York, N. Y.; Traymore
Pearson, Theo. L.; Jenkintown, Pa.; Morton
Pettingell, A. F.; Cambridge, Mass.; Traymore
Pfeiffer, B. V.; Philadelphia, Pa.; Traymore
Phillips, A. L.; New York, N. Y.; Ambassador
Pihlman, A. A.; New York, N. Y.; Traymore
Pruyn, Robt. S.; Yonkers, N. Y.; Traymore
Purcell, Theo. V.; Chicago, Ill.; Ambassador

Q

Quaintance, R. E.; Newark, N. J.; Marl.-Blen.

R

Reilly, Wm. E.; Newark, N. J.; Strand
Reitmeyer, A. F.; Perth Amboy, N. J.
Richman, H. H.; Philadelphia, Pa.; Knickerbocker
Rogers, Wm. J.; Haddon Heights, N. J.; Strand
Rose, Edw. V.; Poughkeepsie, N. Y.; Seaside
Rose, J.; New York, N. Y.; Traymore
Rutledge, F. J.; Phila., Pa.; Marlborough-Blen.

S

Savage, Geo. W.; Chester, Pa.; Breakers
Schleuning, T. H.; Brooklyn, N. Y.; Knickerbocker
Scott, Chas. B.; Chicago, Ill.; Ambassador
Scott, John A.; New Haven, Conn.; Breakers
Smith, Thos. G.; New York, N. Y.; Knickerbocker
Smythe, Chas. W.; Jersey City, N. J.; Strand
Snyder, Francis; New York, N. Y.; Brighton
Spring, W. T.; Cape May, N. J.
Springmeyer, G. F.; New York City; St. Charles
Stanton, E. S.; Montreal, Can.; Traymore
Stock, Alvin M.; New York, N. Y.; Traymore
Stone, Thos. W.; Fort Wayne, Ind.; Traymore
Stridsberg, H. W.; New York City; Knickerbocker
Swain, Henry D.; Ossining, N. Y.; Strand
Swift, W. C.; Waterbury, Conn.; St. Charles

T

Titus, Ralph E.; Brooklyn, N. Y.; Traymore

U

Ulbricht, Emil; Newark, N. J.; Haddon Hall

W

Whal, Edw.; Baltimore, Md.; Strand
Walsh, J. H.; Brooklyn, N. Y.; Marl.-Blen.
Walsh, Thos. F.; Saugerties, N. Y.; Ambassador
Waterman, A.; New York City; Ambassador
Weiser, John A.; York, Pa.; Strand
Welsh, M. G.; Stroudsburg, Pa.; Ritz-Carlton
Westermaier, F. V.; Philadelphia, Pa.; Commuting
Whitcomb, Donald; East Orange, N. J.; Day
Wyer, Saml. S.; Columbus, Ohio; Chalfonte

X

Xylander, Peter; Hackensack, N. J.; Haddon Hall

Y

York, Palmer; Boston, Mass.; Traymore
Yurkovitch, Martin; New York City; Knickerbocker

Z

Zingg, J. P.; Orange, N. J.; Haddon Hall

American Gas Journal

SIXTY SEVENTH YEAR

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Analysis of Gas Company Statistics *

Report of 1925 Committee

H. J. LaWall

Chairman, The United Gas Improvement Company, Philadelphia, Pa.

ON account of the growing demand for statistical information by public utility managements and others, a committee was organized by the Managing Committee of the American Gas Association last year to be known as the Committee on Analysis of Gas Company Statistics, this committee to make a study of this important subject.

The principal subject considered by this committee was the "Value of Statistics as Applied to Gas Sales, Revenues and Costs."

The committee recommended that Gas Sales and Revenues be sub-divided on the basis of the use of the commodity and a classification arranged on this basis was therefore included in last year's report. It was pointed out that a study should be made with the idea of developing a cost system which would be applicable to the "use" classification recommended for sales and revenue.

In accordance with this recommendation, a sub-committee was appointed by this year's Committee on Analysis of Gas Company Statistics to develop a cost analysis for gas companies whereby the companies, by applying the analysis, can ascertain the cost of supplying the different classes of customers served.

The Report

Under the leadership of R. H. Knowlton, chairman of this sub-committee, a report has been prepared for delivery and discussion. With the constantly changing conditions in our business with respect to investment, character of customers served and demands on the service, the method of analyzing costs as presented by Mr. Knowlton should be of interest to every gas company, and it is hoped that this report will at least start a trend of thought which will eventually result in every gas company knowing the cost of serving its customers.

Another sub-committee was formed this year to study all questionnaires at present being submitted to gas companies by such agencies as the American Gas Association, Brown's Directory of Gas Companies, Moody's Manual, Government Bureaus, etc., and to endeavor to co-ordinate and standardize the information called for on all such questionnaires.

Under the leadership of G. S. Cremer, chairman of this sub-committee, a report has been prepared for delivery and discussion.

*Delivered at the Wednesday meeting of the Accounting Section, A. G. A. Convention, Atlantic City, October 14, 1925.

Development of Cost Analysis for Gas Companies

Report of sub-committee

R. H. Knowlton

Chairman, The United Gas Improvement Company, Philadelphia, Pa.

IF this history of trade were written, its beginning would be contemporaneous with that of the human race. Trade naturally suggests the creation of material things whether they be agricultural, mineral or forest product. The story of the early period would deal with products resulting from both crude and simple processes. Before the creation of a common medium of exchange, which we term a monetary system, the ordinary method of trade was to exchange a given quantity of one product for that of another. The accruing profit from such a transaction had of necessity to be measured in terms of the need or desire for the article on the part of one party to the trade as against the advantage which his judgment ascribed to the retention of the article offered in exchange. With the adoption of a common medium of exchange, or monetary system, to whose base all articles of trade could be reduced, there developed the idea of trade profit that could be definitely measured and, therefore, relatively compared. The possibility of a profit and, therefore, the practice of the endeavor to secure one led to the adoption of a system by which the progress of the creation of articles for trade in terms of cost measured by the one medium of exchange could be recorded. Such a system, which may be termed an accounting or cost system, had for its principal object the determining of a sales price that would carry with it a profit to the producer.

Since the processes involved in the creation of various articles were originally, as has been pointed out, both crude and simple, it followed that the cost system required was also simple.

With the development of trade, however, the process of production became more complex and the number of different articles offered in trade by one individual or company increased. This necessitated the introduction of refinements in the accounting or cost system so as to make possible a determination of prices for the different articles.

Necessity for Refined Cost System

There are many lines of trade in which it is easy to recognize physical differences in the various articles produced, which differences in themselves suggest differences in value and usually, therefore, in cost. Such lines were among the first to recognize the necessity for refined cost systems that would permit of the naming of sales prices that reflected with mathematical accuracy the cost of production and the desired profit of the producer. There were many lines of trade, however, in which these differences could be recognized only after careful analysis. Those lines which offer a service rather than material articles are examples, such as—telephone companies. It is perhaps but natural, therefore, that the gas industry is known among the lines which have been slow to appreciate the necessity and advantage accruing from the adoption of a refined cost system which would actually reflect differences in cost incident to the rendering of different kinds of service.

Various Elements in Total Cost

The history of the industry unquestionably reflects the belief on the part of those responsible for its growth and development that it was offering a material article or commodity in trade and since it was not possible to recognize any difference between one 1,000 cu. ft. of its product and another, it was commonly thought that a cost system admirably adapted to a business which produced but a single kind of article was all that was required in the gas industry. With the recognition of the fact that the article offered in trade whose unit is 1,000 cu. ft. is but one element of the total cost which is overshadowed in cost by that other intangible thing which is furnished, namely—service, cost system students have recognized the necessity of the establishment by the industry of a sufficiently refined cost system as to reflect differences in cost of furnishing gas service under conditions widely varying which have come to be known as classes of service.

The first American Gas Association committee to give consideration to this problem was the Rate Structure Committee, to whose work, as reflected in their reports of 1922 and 1923, the industry is greatly indebted and which has greatly facilitated the work of your present committee which has been charged with the consideration of this problem. The work of the latter is reflected in the report which is submitted herewith. It is perhaps not an over-statement to say that the majority of the personnel of our industry has been but mildly interested in the subject and but academically at that.

Your serious attention to this important subject is urged as the development of an adequate cost system is essential to the full development of the industry and such a system can only be attained through the painstaking study of the many and their resulting suggestions for improvement.

Your committee has derived substantial benefit from the opportunity presented to it to study the subject, and desires to call your attention to the fact that the industry at large can only attain to like benefit by giving this report careful thought.

The importance to the industry of assigning current problems to groups of men for solution is undeniable, but the practical result from a knowledge of the correct solution is but partially secured unless adequate means of dissemination are adopted.

Your committee earnestly recommends the consideration of the association to this latter problem.

Standardization of Questionnaires

Report of sub-committee

G. S. Cremer

Chairman, The Brooklyn Union Gas Company, Br ooklyn, N. Y.

FOR many years gas company accounting officers have talked among themselves of the Questionnaire Evil, the Annual Nuisance, and the Seven Weeks Plague. In December, before the last entries are made in the books, the flood of questionnaires begins and it continues, with new requests mixed in with second and third requests and follow-up letters, during all the time when the Accounting Department is working at full speed to complete its trial balance, its income account and balance sheet, its summary statements for the board meeting, annual report for the stockholders' meeting, report to the Public Service Commission, report to the State Tax Commission, Federal income tax return, Federal and State income tax information returns, and its own operating and statistical statements and records. Then, when all of these things have been done, the Accounting Department can turn its attention to the questionnaires which have been received from governmental bureau, trade associations, publishers of trade directories, investment manuals, financial journals, and newspapers, banking houses, insurance companies,

and others who require or desire information which may or may not be readily available.

But the questionnaire really is not an evil, and it need not be a nuisance or a plague if we prepare for it with a proper degree of foresight.

Preparation is prerequisite to performance in statistical work more than in work of any other kind. Sometimes proper preparation is almost all that is necessary, and the work will very nearly accomplish itself.

General Classification of Information Called For

The study which has been made of something more than 50 questionnaire forms has shown that the items of information required may be conveniently classified under seven general heads. By standardizing the arrangement of the subject matter under these seven heads in accordance with the general principles which govern the designing of all accounting statements, we are able to lay the foundation for a few standard questionnaire forms which will fill all the needs of the purposes for which they are intended.

The seven general heads, and the subject matter included under each one are listed below:

1. Identification: such items as the date and place of incorporation, reference to the law under which the company was incorporated, list of officers and directors, location of business offices and manufacturing plants.
2. Financial structure: list of securities, with all necessary particulars as to each issue.
3. Financial status: the balance sheet, set out exactly according to the uniform system of accounts, with items not sufficiently described by the general captions either explained by notations in small type under the general captions or presented in subschedules.
4. Financial results: the income and profit and loss accounts, set out according to the uniform system of accounts and amplified when necessary in the same manner as the balance sheet.
5. Description of plant: showing the number of units and capacity of the principal parts of the manufacturing plant and distribution system.
6. Operating statistics: showing quantities of gas made and sold, quantities of materials used, residuals produced and sold, and similar items.
7. Historical summary: showing by years:

Dividend record.
Interest record.
Condensed balance sheet.
Condensed income account.
Statement of sales and other service data.
Capacity of plant and other physical data.

Conclusion

The committee has weighed the advantages and disadvantages which might result from each of the four degrees of standardization enumerated in this report, and would recommend that:

1. The first step; or standardization of subject matter is absolutely essential.
2. The second step, standardization as to purpose, to the effect that we may at least have only three forms, or one for each of the three most important purposes for which questionnaires are ordinarily used, is not subject to any serious objection, and would save a very considerable amount of labor.
3. The third step, standardization as to specific parts, has been accomplished by the committee, so far as was possible, in the arrangement of the three suggested forms shown in Appendix A, B and C. (The same is also true with regard to the first step.)
4. The fourth step, that of complete standardization, is the logical labor-saver, and while there are instances in which its use might not be wise, the committee does not hesitate to recommend that it be used, with proper care and discrimination, by companies which have no reason for limiting themselves to the second step in standardization. In the few cases in which it is thought best not to give a complete copy of the already prepared summary, specific questions could be answered separately, as they have been in the past.

(This report is published in full in the Proceedings of the American Gas Association.)

The Public Utility Purchasing Agent*

An analysis of the work and duties of the buyer

J. M. Knowles

The Consolidated Gas Company of New York, N. Y.

PURCHASING is the procuring of goods or services for a price and the purchasing department came into being as the result of a demand in business concerns that the materials they buy may be delivered when required, and at the right price.

Creation of the purchasing department was brought about through the necessity of doing these three things in the soundest and most approved manner. Prior to the time of the purchasing department, proprietors, superintendents, department heads and others purchased materials for processing or use in

*Read at the Wednesday Meeting of the Accounting Section, A. G. A. Convention, Atlantic City, Oct. 14, 1925.

their establishments from such sources of supply as were able to effect prompt deliveries.

First a Part Time Job

Purchasing was therefore a part-time job handled as a side-line by some one who had other detailed duties. Consequently, it followed that a regular system of purchasing and delivering was not often in effect, that materials were not ordered until an acute demand had arisen and then they were purchased from the standpoint of quick delivery alone. Even on those items on which a survey had been made prior to the need of them, the tendency was towards limiting the sources of supply to those who had satisfactorily performed in the past. There was no systematic method for tracing new sources of supply nor was there much if any research for substitution of the materials commonly used. Records of previous prices paid were not available. There was no means of comparing the prices paid with those secured by other purchasers, nor was there accomplished any appreciable amount of research or testing of materials.

It was perfectly logical, therefore, that the men be trained so that they would be equipped to spend the enormous amounts of money that are necessary for manufacturing purposes in our industrial enterprises. Formerly, and to a certain extent today, purchasing agents were appointed to their positions because of their honesty, faithfulness and energy. This partly filled the bill. The need was and still is for men who, first of all, know the business for which they are to purchase; second, who know the materials that they are asked to buy; third, who understand sound purchasing methods; and fourth, who know men.

These are the four prime requisites of the successful buyer:—Knowledge of the business, knowledge of materials, methods and men. Such men are not easily and quickly available. They must be trained and educational efforts are being made.

Centralized Purchasing Satisfactory

The change which brought about centralized purchasing is generally satisfactory to all concerned. The proprietor may still approve or reject the purchasing agent's recommendation and the superintendent or department head may still specify what he thinks is best for his needs, and he is also comparatively free from the visits of sales representatives who take up the time he needs to devote to his regular duties. The salesman certainly is in sympathy with the movement towards centralization inasmuch as he can now offer his selling argument to a man who, combining the purchases of several departments or plants, is naturally a better customer. Were it not for the fact that all buyers as yet do not know the physical aspect and application of the materials they purchase as well as the men actually using them, the salesmen who would prefer to devote all their time to the purchasing agent.

The shortcomings of the buyer in this respect and the fact that some salesmen have a better chance for an order with a superintendent or a department head than they do with the experienced buyer, are the only reasons why they still try to effect sales through superintendents or others in authority. To be fair to the buyer, we must remember that, especially in a large company, he would have a difficult time learning all about the material he purchases. The assortment is far wider than is imagined. This is where the buyer must be guided by the opinions and judgments of those in his own company. He must listen to competent counsel from those in his own company and the spirit of true co-operation should prevail. He must be tactful and diplomatic in his contacts with others in his own company. He should not forget that every man thinks he is a born trader and a good judge of values. Every man loves to beat the market if he can.

The Value of Merchandise

Every man loves to try to get something for nothing. If it were not so some second-hand automobile dealers would have to go to work for a living. Many men not actively purchasing are good judges of value, but I have found usually that they judge the worth of an article by what return it will give them, while the purchasing agent should not only judge value in this way but also judge the worth of the article by its intrinsic value, that is, by his analysis of the value of so much lumber, steel, leather, rubber or whatever goes into the fabrication of the article in question. If the purchasing agent can judge values this way he is in a better position to sell his buying arguments to the vendor, for he displays a knowledge of the article to the vendor's representative that is pleasantly surprising and productive of respect. Believe me, the sales representative is not a hard man to sell on this idea, as he meets only too infrequently with men able enough to talk his own article in his own language. A contact formed in this way makes the salesman your representative to his employer and he will go to great lengths to get you what he can in quality, price and service.

Contract Arrangements

Centralized purchasing has brought about an increase in "contract" arrangements, as naturally the requirements to be purchased by one man acting for several plants are greatly increased. As they are to be used for the same purpose the quality or grade can be standardized, bringing about better deliveries and more advantageous prices. Let us consider contracts. The prevailing idea of the advantage of a contract to the buyer is that he may secure a lower price by such an arrangement. To my mind, that is not the primary consideration, although it is very important.

The essential thing in a contract is that the buyer assures himself of a supply of material of proper quality and guaranteed delivery. The mere fact that material necessary for the operation of a plant has reached a point in volume where a contract is considered, makes it important that the contract be drawn so that you may be sure of having the material on hand when it is required. A contract or agree-

ment written from price standpoint alone without sufficient guarantee of quality and assured delivery is not only unsound but dangerous, as it creates a false sense of security, and the failure to deliver is usually timed with an acute demand for such delivery.

Contracts are sometimes written to beat the market on price. When this is accomplished and all other considerations are warranted it is a fine stroke. Specific market study of a given material and direct information from producers and manufacturers form the soundest basis for forecasting future price trend. No buyer can hope to consistently beat the market. If he shades the market price, and by market price I mean the usual going price for the quality and quantity involved, he should not be criticized, for if he is urged to constantly beat the market it is only logical to assume that some day the market will beat him, and homehow this unpleasant occurrence is remembered long after the good purchases are forgotten.

Substituted Materials

In our desire for low cost production the buyer can play an important part in the substitution of materials of qualities other than those usually obtained. I wish to digress a little here and state that by substitution I do not necessarily mean something cheaper. Sometimes the article recommended as a substitute is cheaper in price but many times substitution is effected by the use of a better and higher priced material than formerly used, to the end that a lower unit cost of service may be rendered by that article. I cannot stress too strongly that this is one of the most important phases of sound purchasing.

Eternal Vigilance

The price of economical and sound purchasing is eternal vigilance. Competition is the watchword. It is contended by some that a connection can be formed with a vendor in which materials will be furnished without competitive bidding, and at the lowest price the market affords. That is not usually true, and I might say that it is never true except that the statement is not politic. I will note the exception of a few one-priced articles usually applying on a patented or highly specialized device. On raw and staple materials which form the bulk of our purchases, prices from different sources of supply do vary. Production costs differ;—overheads, selling expenses and profits are not parallel, and it is the buyer's job to find the concern with the lowest selling cost for stipulated quality. He cannot fail to find it if he tries. At one time, some years ago, I was asked why I placed orders with so many new concerns, it being overlooked that in putting a new concern on the list of creditors, I was opening up a new source of supply with a reputable house and at prices lower than elsewhere, otherwise no order would have been given. Of course, in this connection common sense and consideration of the accounting department's function must not be overlooked.

Effect of Competition

Competition brings about contact with manufacturers to the exclusion of the unnecessary middlemen and profit takers. An order placed directly with the manufacturers is a step in advance when that manufacturer offers a competitive figure and equal delivery. Opinions are divided on this particular phase and each case should be decided on its own merits and orders placed accordingly. Some jobbers and dealers are absolutely necessary for the service they render at a reasonable profit, but a tendency towards purchasing directly from manufacturers opens up the particular case for investigation and action. Where such investigation shows that the manufacturer does not protect the dealer on price, it is then plain that direct purchasing is in order.

Purchase of Repair Parts

In the purchase of repair or replacement parts for machinery and apparatus there are very effective savings to be made. It is quite well known that many manufacturers of these items charge high prices for such parts and when they reach an appreciable amount the buyer, from his knowledge of materials and with the invaluable assistance of the plant or shop man, should have drawings made of the parts required, whether they be cast, forged, drawn or spun. He will find plenty of foundries who will turn out castings of steel, gray iron or bronze at pound prices and any number of shops which will supply him with forged or fabricated work to his sketches. The necessary machine work on these parts may be done by outside shops or in the buyer's own shop. It will be found that great differences in price prevail and they are all to the buyer's advantage. There is no sacrifice in quality as that is specified and it can be secured from reputable suppliers.

The Credit Question

The buyer has a great advantage in purchasing for a public utility. The company's credit is usually unimpaired, it is naturally well known in its community and elsewhere, it is considered good clean business, and it has a testimonial value with the vendors—and they just love to sell to such customers. The buyer's path is made easy through prompt payments of bills and I have many times clinched a good price agreement with the final statement that our money was good, and we stood ready to discount the bill. The real saving made in discounting bills is the actual cash discount plus the price advantage the buyer gets because he can guarantee a quick payment.

Rush and Personal Purchasing

May I say a word about rush purchasing and personal purchasing Certainly the purchasing department must be equipped to handle rush items. They should be kept to the lowest possible minimum as the time consumed in placing the usual rush or emer-

gency order is much more in the long run than that consumed in placing the same order in its regular and ordinary way. However, it is on rush orders and particularly personal orders (and they for some reason are always rush) that the efficiency of the purchasing department is sometimes judged.

It seems that the employer who is not aware that his purchasing agent may be using all of his available men in the purchase of thousands of dollars' worth of material for the company at that time, forms his opinion of the purchasing department on the service rendered him on his personal purchasing. The buyer may be in the middle of trying to knock a couple of dollars a ton off the price on an order for eight or nine thousand tons of pipe, when he is requested to negotiate personally the purchase of a radio set or is asked to explain why the one he ordered yesterday has not yet been delivered.

Reciprocity

There is another angle to purchasing which gas companies and particularly the smaller companies must consider. This is the reciprocal angle, that is, the advisability of the gas company patronizing jobbers and dealers in its own city. If the utility takes a leading part in civic affairs it usually follows that more or less pressure is exerted to have it purchase from local companies, and indeed it naturally arises that the utility will view this with favor. Certainly this is a problem in which the policy of the company must prevail.

Necessity for Quotations

In purchases from dealers in small cities, it is very desirable to have quotations made or invoices rendered showing list price and discount. By this means it is possible to get a good check on the prices paid and it is much easier to convert a price so named to a net figure for accounting purposes than it is to convert the net figure back to a list and discount figure for price checking purposes. There is another reason for this. On a quotation covering eight or ten articles priced at net figures, I have seen the discount used in figuring the first and last items at, let us say 60 per cent off the list, while the other items were figured at approximately 50 per cent off the list. The point here is that the vendor counts on your figuring the discount on the first item and possibly the last one and then assuming the rest are the same. The easy way to avoid this is for you to specify that the price be quoted at list and discount.

Purchase of Printing

In the purchase of printing a condition arises where it is open to question whether this printing should be done in the utility's own city or elsewhere at lower prices. Where the local flat printing is done in a newspaper shop, the wiser course appears to be in patronizing this source. If, however, consideration of this is not necessary the purchaser will find that printing is highly competitive and savings can be made. In such purchases he must specify the grade and weight of paper required and the quality of work he wishes or he will not save by buying on price alone. As is usually the case in the small utility there is no means of testing paper.

It would be well therefore to buy flat printing on faith from reputable houses. In the larger cities where flat printing is entirely distinct from newspaper work, very substantial savings can be effected by proper purchasing of printing, ruling, binding, and the like. In this situation it again follows that the stock to be used should be specified by the purchaser and in order for him to properly specify he must know the most suitable grades. For this purpose and if the purchasing department does not include in its personnel a good paper and printing buyer the utility should be guided by the suggestions of several reputable printers. On important jobs the purchaser had best specify that the paper be watermarked as this immediately establishes the grade and eliminates all chance of substitution by the printer. In this connection it may be interesting to know that watermarking paper adds only one-quarter to one cent per pound to the price of the same grade in unwatermarked stock.

Refrigeration With Gas*

Report of refrigeration by gas companies

H. DeWitt Valentine

Chairman, Chicago, Illinois

Introduction

THE subject of refrigeration with gas is at the present time not only very intangible to the gas industry in general and the public at large, but is one which requires a tremendous amount of study and investigation before it can be successfully and intelligently offered for serious consideration. That this tremendous amount of effort and study must be accomplished in as short a period of time as possible is not only desirable but is imperative, because of the increasing effectiveness of competitive merchandise in this field and also be-

*Presented at the Wednesday Meeting of the Commercial Section, A. G. A. Convention, Atlantic City, Oct. 14, 1925.

cause of the necessity for a compensating load adequate to fill the valley which is being caused to a greater extent by our ever increasing house heating business.

Bearing these two important considerations in mind, the Committee on Refrigeration with Gas, appointed by the chairman of the Commercial Section, has endeavored in the following pages to give as complete a resume of the subject as could possibly be done in the time allotted for this activity. There is no question that the report is elementary in many of its phases, but the committee believed that a technical report which would be unintelligible to the general reader would have little or no value for the purpose it is intended.

Establish Interest

In launching a new, though very promising, use for gas it is necessary primarily to establish the interest, the attention, and the co-operation of three distinct contributing factors: first, the public who are to use the product; second, the company which is to merchandise the product; and third, that organization either exterior to the gas company or an integral part of it, which is going to make it possible, through the use of certain appliances, to establish the customer and gas company relationship.

This report has been written and edited from that standpoint alone, for it is believed that if the three factors mentioned above are satisfied, then the project can be assured of success.

Statistics

There has not been time during the operation of this committee to compile any statistics regarding the manufacture and increase in the industry of ice machines for household use. Beyond question, the increase in appliances of this kind would be even more staggering than the increase in the use of artificial ice. By the end of the coming year, the committee hopes to have secured this data on mechanical refrigeration as applied to the homes.

As a concluding idea, however, the data now presented is sufficient to lead us to believe that the time for artificial refrigeration and its development is at hand, and that the sooner the manufacturer, the gas company, and the public will realize that the absorption type of machine, coupled with the use of manufactured gas, presents opportunities in a very interesting field, the better it will be for all concerned.

Although essentially dealing with small household refrigerators, the committee is very optimistic in that the future of refrigeration is far from restricted to such operations. When the heating season begins, the public begins to light its fires to warm up the rooms. It is not unreasonable, therefore, to expect that this same discriminating public will find that when the temperature goes considerable above 70 degrees they will be too warm for comfort and, consequently, will seek methods by which to bring down this temperature to the zone of comfort. That this condition is already an actuality is shown by the numerous theatres, halls, and office buildings in which the air is now cooled, during the summer, before being admitted to the various rooms in which the public gathers. It is just one more step from the theatre to the home.

Why Refrigeration?

The most important reason for adequate refrigeration in the home is to counteract the toxic effects of bacterial and fungal growths in food stuffs. This is far more important than the mere act of keeping butter hard for the table, or fresh greens in a crisp and palatable condition.

Further, the unfortunate part about bacterial activity is that it is most pronounced in foods which are of the greatest importance to the normal health of man. This includes butter and milk, chiefly, and all foods made wholly or in part from these two primary ingredients; consequently, this report would not be complete without an elementary discussion of the relation between bacterial and fungal growth and temperature. It seems fitting to do this, in other words, because it forms the keynote for excellent sales talks, not only to interest the public, but also gas companies and manufacturers of refrigerating equipment as well.

Temperature Tabulation

Following is a table showing cold storage temperatures, or temperatures which inhibit bacterial growth in that particular food stuff.

Cold Storage Temperature

Fruit

	Degr. Fahr.
Apples	32-36
Bananas	34
Berries, fresh	36
Cranberries	33-36
Cantaloupes	40
Dates, figs, etc.	50-55
Fruits, dried	35-40
Grapes	34-36
Lemons	33-36
Oranges	34-36
Peaches	34-36
Pears, watermelons	34-36

Meats

Brined	38
Beef, fresh	33

	Degr. Fahr.
Beef, dried	36-40
Calves	32-33
Hams, ribs, shoulder (not brined)	20
Hogs	29-32
Lard	38
Livers	20-30
Sheep, lambs	32
Ox-tails	30
Sausage casings	20
Tenderloin, butts, etc.	33
Fish	
Fresh fish	20
Dried fish	36
Oysters in shell	30-35
Oysters in tubs	25
Canned Goods	
Sardines	35-40
Fruits	35-40
Meats	35-40

Butter, Eggs, Etc.	Degr. Fahr.
Butter	18-20
Butterine	18-20
Cheese	34
Eggs	31
Vegetables	
Asparagus	34-35
Cabbage	34-35
Carrots	34-35
Celery	34-35
Dried beans	32-40
Dried corn	35
Dried peas	35-40
Onions	36
Parsnips	34-35
Potatoes	36-40
Sauerkraut	35

The A-B-C's of Mechanical Refrigeration

As regards heat content of a body, refrigeration and heating are purely relative. A refrigerator at 40° F. is decidedly hot when compared to 460° F. below zero, which is the lowest attainable temperature. At the same time, a day in August registering 108° F. is frigid when adjacent to 1800° F. produced in certain metal melting furnaces. Again, the idea of heating is popularly confined to those processes where thermal energy is added to raise the temperature above that point at which we are accustomed to live comfortably; while refrigeration implies the withdrawal of thermal energy to a point below ordinary temperatures. Here again, the terms are synonymous, for, if heat is withdrawn from one body, it must necessarily be added to another; and we experience a heating effect as well as refrigeration. If we forget the terms "cool" and "cold" and define refrigeration as, "the withdrawal of heat from a space to that degree at which bacterial activity ceases," then it is a simple matter to understand clearly what is to follow.

Water is a liquid at ordinary temperatures and at atmospheric pressure which is also zero pounds gauge pressure. If we apply heat to a vessel containing a pound of water we shall find that the temperature rises until 212° F. is reached. The addition of more heat does not increase the temperature but serves as the source of energy to change the state of the water from a liquid to a gas, which we call steam. This quantity of heat energy, if measured, will equal 970 B.t.u. for every pound of water at 212° F. Conversely, 970 B.t.u. of heat are liberated to the surroundings for every pound of steam at 212° F. condensed to water at 212° F.

Heat which affects a change of state in a substance is called "latent" heat to distinguish it from "sensible" heat, which can be measured on a thermometer. Latent heat can be further classified as:

Latent Heat

A. Latent heat of vaporization (or condensation) which is defined as the quantity of heat required to change one pound of liquid at its boiling point to vapor at the same temperature, or, conversely, that same amount of heat which is subsequently liberated when one pound of the vapor at the boiling point is condensed to liquid at that temperature.

B. Latent heat of fusion (or liquefaction) is equal to that quantity of heat in B.t.u.'s necessary to change one pound of a solid at its freezing temperature to one pound of liquid at the same temperature. On the other hand, this same quantity of heat is withdrawn when the pound of the liquid at its freezing point is changed to a solid at that temperature.

The latent heat of vaporization of water has been given as 970 B.t.u. The latent heat of fusion is equal to 144 B.t.u. per pound.

If now the water is heated under pressure, more heat will have to be applied before the boiling point is reached, this rise in boiling point being proportional to the gauge pressure, in pounds, under which the water is being heated. For example, at 4 pounds gauge pressure the boiling point is 225° F. and at 15 pounds, 250° F. On the other hand, if the pressure under which the boiling is accomplished is below atmospheric or zero gauge pressure, then the point of boiling is reduced proportionally to the reduction of pressure as measured in "inches of vacuum." At 5 inches of vacuum, for example, water boils at 200° F., and at 15 inches of vacuum, 175° F.

Latent heat values change somewhat with pressures, but that will be omitted from our discussion, as it does not particularly concern the major operations of a refrigerating unit.

Ammonia

The above data is probably familiar to all because water is such a common substance. However, the effects of pressure on the boiling points of various liquids are similar, as are also the latent heat properties. The only difference is the wide temperature variations at which these effects manifest themselves. Consider ammonia, for example. Ammonia is a gas at ordinary temperatures and pressures, and we are acquainted with it mainly as a solution of the gas in water, called household ammonia. If, at atmospheric pressure we cool a volume of ammonia gas to 28° F. below zero, we reach the condensing (or boiling) point and will produce liquid ammonia. As is the case with water, if we increase the pressure, the boiling point will be raised. At 9 pounds gauge pressure the boiling point is 10° F. below zero while at 100 pounds gauge pressure it is 65° F. above zero. Decreasing the pressure below atmospheric, of course, produces the opposite effect as in the case of water. The relation between pressures and boiling points of water and ammonia are given in the following table:

WATER		AMMONIA	
Pressure Pounds Gauge	Boiling Point °F.	Pressure Pounds Gauge	Boiling Point °F.
26" vacuum	125	0	—28
15" "	175	3.8	—20
5"	200	9	—10
0	212	1.6	0
4	225	24	10
15	250	33	20
31	275	45	30
52	300	58	40
81	325	74	50
119	350	93	60
169	375	115	70
230	400	139	80
415	450	168	90
660	500	200	100

Ammonia is called the "refrigerant" and is more commonly used than any others (among which may be mentioned sulphur dioxide, carbon dioxide, methyl chloride and ethyl chloride).

Two Types of Refrigerating System

There are two general types of refrigerating systems in use today, (1) the compression system, and (2) the absorption system.

The compression system is illustrated in Figure 1. The liquid ammonia is kept in the receiver. The expansion valve allows the ammonia to vaporize in the expansion coils situated in the "cold" room. The heat (latent) necessary to vaporize the ammonia is taken from the sensible heat in the air of the cold room and the same frost effects become visible on the surfaces of the expansion coils that were so noticeable on the coil in our previous illustration. The low pressure ammonia vapor is sucked into the compressor from which it leaves under a pressure of about 150 pounds. From our table of pressures and boiling points we observe that ammonia at 150 pounds pressure will liquefy at 85° F. As the ammonia is hot after leaving the compressor, it is led through coils immersed in a running water bath.

The cold water cools the ammonia at 150 pounds pressure to a point below 85° F. and liquid ammonia results, which drops back into the receiver, thus completing the cycle.

Absorption System

In the absorption system, Figure 2, the cycle of operations is the same as in the compression system

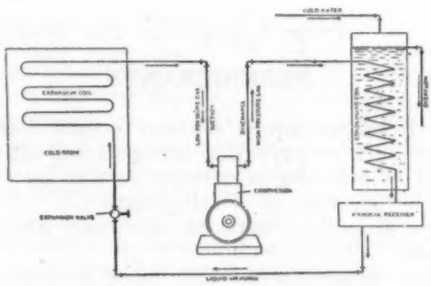

Fig. 1

except that in the place of a compressor, an absorber and generator unit is used. This unit functions, both because of the great solubility of ammonia in water, and because the ammonia is easily and most completely separated from the water by boiling. Roughly at 32° F. one volume of water will dissolve 1300 volumes of ammonia gas, and at 68° F. 710 volumes; that is, the lower the temperature of the water the more ammonia it will dissolve. Because of these desirable properties, ammonia is the only refrigerant so far used in connection with an absorption system.

Using Figure 2 as a guide, the liquid ammonia passes from the receiver to the expansion coils in the cold room through the expansion valve as in

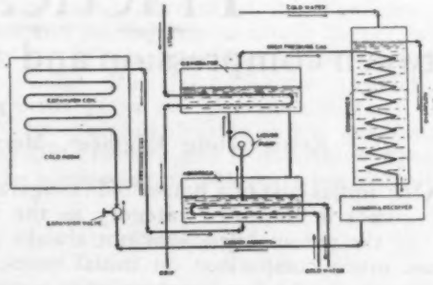

Fig. 2

the case of the compression system. From the expansion coils the low pressure ammonia gas passes to the absorber where it is dissolved in water, kept cool by coils carrying cold running water. The concentrated ammonia liquor is pumped into the generator by the liquor pump. The generator in its simplest form is nothing more than a strongly built closed tank carrying a series of steam pipes used for heating the concentrated ammonia liquor. In the generator the ammonia is boiled off under pressure, leaving at about 110-150 pounds. Both the sensible and the latent heat in the high pressure ammonia gas is removed in the condenser, the ammonia liquefies and runs back into the receiver as in the compression system. The weak ammonia liquor left in the generator flows back into the absorber.

Thermodynamic Comparison

Between compression and absorption types refrigerating machines

W. E. Stark

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REFRIGERANTS

THE refrigerant is without question the most important part of a refrigerating unit. It is a fluid having certain properties, by virtue of which it functions as a refrigerant.

These properties may be discussed under three divisions:

1. The nomenclature and those general properties and characteristics which serve for purposes of identification. They are further qualified as follows:
   a. Name and physical state.
   b. Chemical symbol.
   c. Molecular weight.
   d. Color.
   e. Odor.
   f. Density of liquid.
   g. Density of gas.
   h. Solubility in water.
   i. Methods of manufacture.
2. Those properties which are specifically concerned in evaluating the effectiveness as refrigerants, and divided as follows:
   a. Boiling point.
   b. Melting point.
   c. Critical pressure.
   d. Critical temperature.
   e. Vapor pressure.
   f. Specific heat at constant pressure (Cp).
   g. Specific heat at constant volume (Cv).
   h. Ratios of specific heats (Cp/Cc).
   i. Latent heat of evaporation.
   j. Heat of the liquid.
   k. Total heat of the saturated vapor.
   l. Specific volume of the liquid.
   m. Specific volume of the saturated vapor.
   n. Entropy of the liquid.
   o. Entropy of the vapor.
3. Those properties which affect human health and safety, such as:
   a. Toxic and lethal properties.
   b. Explosibility.
   c. Inflammability.
   d. Methods for the detection of leaks.

The refrigerants which are discussed in the article to be found in complete form in the Proceedings of the A. G. A. are:

1. Ammonia.
2. Sulphur dioxide.
3. Ethyl chloride.
4. Methyl chloride.
5. Carbon dioxide.

Practical Comparison

Between compression and absorption types refrigerating machines

F. W. Tyrell

Refrigerating Engineer, Metropolitan Utilities District, Omaha, Nebraska

THE initial cost of a household refrigerating unit comes in the same category as the first cost of the automobile. It is not always advisable to base much comparison on initial costs, because very frequently the low purchase price means a high subsequent cost as necessitated by repair bills and by a rapidly decreasing efficiency. However, in this point we find that there are small refrigerating machines on the market which sell for from $200 to $1,000, some of which are sold with a specially constructed cabinet as an inducement to prospective buyers, but which also frequently serves to conceal

defects which are later costly. But in the matter of initial cost of machines which will handle boxes of from 150 pounds to 500 pounds ice melting capacity, we must note that the cost of good efficient machines will be about on a level. And, as is the case with good automobiles, the initial cost must be fairly high to allow the manufacturers to put into the construction of the machine such materials and workmanship as will insure the purchaser a reasonable period of service without excessive repair costs or a very noticeable increase in operating cost.

Operating Simplicity

In the question of operating simplicity there is much to be said of both the electric and gas types. Of course, the machine must be automatic. In a modern household, one does not install machines to create labor—they are added to the equipment as convenient labor savers. A machine which requires its owner to watch the temperature of the refrigerator and, upon noting its rising, to start the refrigerating machine, is but little, if any, better than the chunk of ice method which has been in use so long.

There are machines of both types on the market that are governed by the box temperature, either directly or indirectly. The majority of the electrically operated units are directly under the control of the temperature, the thermostat causing the compressor motor to start operation and continue until the temperature is sufficiently reduced. The gas-fired absorption type is indirectly under this temperature control, as a supply of the liquid refrigerant, held in the receiver storage, must be exhausted before the gas fire is lighted to replenish the supply. This may occur at rather infrequent intervals, due to a judicious box use. Thus we may hold the honors even on this score for the gas and electric types.

Long Term Usage

While we are considering operation, let us for a moment think of the problem of an efficient operation over a long term of usage. Here we are confronted with that age-old axiom—"Where there is motion there is friction, and where there is friction there is wear." And we may add, without fear of contradiction, that where there is wear, there is decreased efficiency.

The majority of the electrically operated compressors are driven at a high rate of speed, and are furnished their power by repulsion-induction motors of from ⅛ to ½ horse power. The packing of the piston rods, of course, is subject to wear in proportion to the speed and, if as is true in some instances, this wear is taken up by springs, the added pressure means more friction, more power required, and still more wear. If there is no spring take-up provided, the wear means a rapidly decreased efficiency.

Wear on Moving Parts

Then there is the connecting medium between the compressor and motor. This is of several types; belt, chain, gear, worm or direct connected. All of them wear somewhat. The belt breaks, stretches, slips, runs off the pulley, and squeals. Gear teeth wear to a poor meshing point, they rattle, back-lash and howl, and perhaps break under the strain. Chains get their wear on their sprockets and links. They tend to run high, climb off the teeth, and become noisy, increasing with their use and load. Worm drives are perhaps the least offenders in the matter of friction, but of course their design is adaptable only to slow speeds. The wear of the direct drive is transferred to the crank pin bearings and the wrist pin bearings, which, while sometimes not so noisy, are, to say the least, more difficult of repair.

Then we have the motor. These small sizes for household application, or, to use the worn-out term, lamp socket attachment, are necessarily single-phase and are one of three types: (1) Induction compensated, (2) Repulsion, (3) Repulsion-induction. All of these types have commutators to become dirty and greasy, brushes to wear off, and a low efficiency. Also their bearings are likely to wear seriously in heavy duty operation, and repairs to these small motors are almost as expensive as their original cost.

Thus it appears that we may well give to these small motor-driven compression units a year of operation at good efficiency, and reasonable operating costs. But for longer periods we must expect to pay repair bills, or have operating costs increase in proportion to an impaired efficiency of the unit.

Gas-Fired Systems

The gas-fired units employ the absorption system in which ammonia liquor (a solution of ammonia in water) is heated. The ammonia is driven off as a vapor, which is then condensed to a liquid state by cooling. The pure liquid ammonia is permitted to expand again to a state of vapor, producing the refrigerating effect. Ammonia does not support combustion; it is a very stable gas below 300° F.; it does not corrode iron; and it is easily detected because of the extreme irritation when inhaled in the proportion of one volume ammonia per thousand volumes of air.

Most of the electrically operated units utilize sulphur dioxide (SO_2) because of its lower pressure differentials and its inability to attack copper, which allows the use of copper tubing in the condensing and cooling coils. But about 3.3 times as much SO_2 must be circulated to get the same thermal effect as with NH_3. Sulphur dioxide is not inflammable, is stable at low pressure and is obnoxious when inhaled in the proportion of .305 parts per volume.

Reliability

Then comes the feature of reliability. One never sees a kerosene stove held in reserve in the event

that the gas should fail, but innumerable houses have candles or lamps in readiness for the frequent occasions when the fuses blow, the lines fall or trouble at the plant causes the electricity to be unavailable for periods of time—some short and some of rather lengthy duration. Gas is admittedly the most reliable of all public services and, while the electrical and gas-operated machines may be equally reliable in themselves, yet there is no gainsaying the statement that as a prime power gas is more dependable; and this fact again gives the gas-fired absorption machine the lead over the others.

Cost

But, to a great many users, there comes an item that overshadows all else—cost of operation—and here we find a real discussion. A great many customers have had separate meters put on their refrigerating units so as to have an absolute check of their operating expense. The writer has had occasion, in a period of years, to analyze these costs to some extent, and a few instances cited may throw a little illumination on the subject. I have in mind a private dwelling in which a gas-fired machine of a well-known make was installed, connected to a box rated by its maker at 250 pounds. The rating of the machine was also 250 pounds, which would put the machine under full load. Over a period of ninety days, immediately following its installation, its cost for operation totaled $14.40, or an average of 16 cents per day. A 40-day period in the summer, a year later, showed a cost of $6.80, which average was 17 cents daily. The box, previous to the installation of the machine, had melted from 50 to 75 pounds of ice daily, and ice was 60 cents per hundred pounds!

Characteristics of the Refrigerating Load and Its Relation to the Heating Load

H. DeWitt Valentine

THERE is no question that the introduction of gas for house heating, especially when applied to central heating plants, caused considerable concern among the gas fraternity as to the possible disastrous results that might be expected from the acquisition of such a load if secured in appreciable amounts. There was considerable misgivings as to the adequacy of equipment for distribution in various gas properties, the effect of a seasonal load and the economic functioning of the gas company as a whole, with its coincident idle equipment at certain times of the year; the increased merchandising efforts required successfully to superintend central heating plant installations, with their subsequent twenty-four hour service; the necessity of rate reduction before house heating with gas would become popular; these, and many other phantoms assumed such magnitude that househeating with gas was considered as a spectre in the offing, very much to be feared and very energetically to be fought.

That house heating with gas is being practiced successfully by many gas companies at this date, without the coincident fatalities that have been ascribed to it, is of course a reality. At the same time, it must be recognized that the continual acquisition of more of this house heating business will naturally cause a peak during the heating season with a corresponding valley during the other portion of the year. There is no question that a send-out which contains a constant seasonal load is an excellent indication of merchandising efficiency. The lighting load is almost nil; the industrial and cooking business is, as a seasonal load, fairly constant; water heating and house heating are the two great variables existing today. Since, however, house heating has apparently come to us to stay, it appears that it is much more sensible to secure ways and means to fill up the valley produced by the house heating load than to worry about methods of cutting the peak. We believe that refrigeration is one means by which these seasonal valleys can be raised to approach the levels of the peaks.

This Report will be found in full in the Proceedings of the A. G. A.—*Editor*

Distribution *

Report of 1925 committee

H. E. Bates

Chairman, The Peoples Gas Light & Coke Company, Chicago, Ill.

THE success of the Distribution Committee for 1924 demonstrated the fact that a large committee can and will function successfully. While this may not be true for all committees engaged in the various activities of the gas industry, it certainly has proven true in connection with distribution work.

The reason may be due to the fact that there is such a variety of subjects of importance to the distribution man and his problems have to do with millions of dollars of investment buried in the ground not subject to daily observance but subject to continual deterioration. The proper maintenance of this concealed property is absolutely necessary to safeguard the public.

Profiting from the experience of the 1924 Distribution Committee, the 1925 Committee was organized along similar lines, having a membership of some 46 members, representing both the manufactured gas and natural gas interests all over the United States. After its organization, each member was requested to submit subjects which should be considered by the committee. The suggestions received covered such a variety of subjects, all of them important, that it was impossible to cover them all, so it was necessary to select a few subjects for the committee's work.

It is no doubt true that the investment in a distribution system, consisting of mains, meters, and services, represents from 40 per cent to 60 per cent of the total investment of any company, and the larger portion of the distribution investment is no doubt in the mains. Therefore, anything that a distribution committee can do to reduce the investment or maintenance of mains, either by improved design of a main system or by improved methods of installing and maintaining the system, will represent an enormous saving to the gas industry as a whole.

Work Continued

It was therefore decided to confine the work of the 1925 Distribution Committee to those problems having to do with the design and installation of mains and 24 questions covering these subjects were sent to each member of the committee. The fact that every member returned answers to the questions indicates the interest takn in the work.

The answers received were grouped according to the subject covered and certain of the members were asked to summarize each group of answers. The diversity of opinion shown by the replies to the questionnaire showed the need for a full discussion and accordingly a two-day conference was held in Detroit, Michigan, on June 11 and 12, 1925.

In order that the most benefit might be obtained from the conference, it was open to all gas men, whether members of the committee or not, and 130 were in attendance, coming from 18 states.

The free and informal discussion resulting in an exchange of ideas indicated that the distribution engineer is thoroughly alive to his problems and recognizes the need for a more complete standardization of practices. It is hoped that in the near future at least some of the important methods regarding which there is at present such a diversity of opinion may become standardized. The conference recognized this need and adopted several resolutions which are a step in that direction.

The committee report following presents a summary of the answers received which were discussed at the conference and also resolutions passed.

The summary to Question No. 9 has been omitted from this report. This had reference to definition of terms and will be covered in a report of a sub-committee organized to formulate such standard definitions.

In conclusion it is believed that the 1925 Committee's work demonstrates the need of more intelligent and constructive discussion of the many important problems of the distribution engineer and the need of assembling information regarding methods to the end that in so far as possible they may be standardized.

If the work of the 1925 Committee can hasten the accomplishment of this end, it will consider its work well done.

*Presented at the Wednesday Meeting of the Technical Section, A. G. A. Convention, Atlantic City, Oct. 14, 1925.

Summaries of Replies to Questions on Distribution Questionnaire

LIFE OF PIPE

Question No. 1. "There is wide difference of opinion regarding the relative life of cast iron, wrought iron, and steel pipe. Please give any data you may have regarding the actual life of these three kinds of pipe, as installed in your system; also state general soil and electrolysis conditions."

Summarizing, one answer may be quoted which sums up in a few words what seems to be the majority opinion on the question. .

"Cast Iron—Life of pipe generally considered indefinite except where subject to electrolysis.

"Wrought Iron—Where not subject to electrolytic action and in good soil, the life of wrought iron can also be considered indefinite. Our company has removed and relaid wrought iron pipe which has been underground over forty years. It was found to be in very good condition.

"Steel Pipe—Have not been using steel pipe long enough to determine life. Under favorable conditions, I see no reason why steel pipe should not last as long as wrought iron."

MAXIMUM PRESSURES FOR CAST IRON PIPE

Question No. 2. "What do you consider the maximum pressure for which cast iron pipe should be used, assuming that a joint can be made which will stand the maximum pressure that the pipe will stand?"

The answers to this question indicated that the safe pressures to be carried were not based upon that pressure which would cause the pipe to burst but were based upon that pressure which would be safe to handle and cause a minimum of damage in case of breaking of the pipe due to some cause other than the pressure of the gas.

Most all of the answers held the opinion that the pipe should withstand an internal gas pressure of at least 100 lbs., but because of its brittleness, making it subject to breakage due to exterior causes such as frost, or settlement, the safe pressure should be much below the bursting pressure.

Reference was made to the fact that cast iron pipe was carrying water in excess of 100 lbs. pressure but in this case the breaking of the pipe due to external conditions would not cause any serious damage, whereas the same condition with a pipe carrying gas might cause extensive damage.

The general opinion expressed was that cast iron pipe should not be used where the gas pressures exceeded 25 lbs., and several replies limited the pressure to 10 lbs.

THE USE OF CENTRIFUGAL PIPE

Question No. 3. "The new centrifugal pipe is creating a great deal of interest and in order to obtain as much information as possible regarding its use to date, will you give the following information:

"(a) Mileage laid with lead joints, cement joints, brazed joints or Dresser couplings.

"(b) In your opinion, is it more easily broken than sand cast pipe?

"(c) Do you find it difficult to cut or tap?

"(d) Have you experienced breaks on any installations you have made, and if so, describe as fully as possible where the breaks occurred. If breaks occurred at brazed joints, did break occur at joint or back of joint? How far back of joint?

"(e) From your experience with centrifugal pipe, give your opinion of it, stating fully its advantages and disadvantages and any suggestions you may have for its improvement."

The answers to this part of the question show 13 advantages expressed and 10 disadvantages, listed as follows:

Advantages

Greater tensile strength.
Free from sand holes.
More uniform thickness.
Less weight per foot.
More uniform texture.
Cleaner than sand cast.
More homogeneous, therefore should better resist corrosion.
Weight less, therefore less cost.
Easier to cut with wheel cutters.
No sand or blow holes.
Unexcelled for brazing.
Slightly less cost per foot.
Plain end pipe makes better and quicker joints, hence economy.

Disadvantages

A weaker joint on account of plain ends.
On account of brittleness more liable to break at tap.
No bead on spigot.
Break easier under shock.
Thickness of metal not properly amalgamated.
Being more brittle, it must be more carefully handled in unloading, hand cutting and hand tapping.
Thinner, therefore not as much thread.
No bead.
Required extra equipment.
Required extra labor.

A study of the foregoing analysis leads to the following conclusions:

1st. That the experience of the various companies reporting is such and the experience shown as existing is so limited that no conclusion or recommendations could be formulated at this time.

2nd. That the jointing of this pipe by the bronze collar does not seem to be very satisfactory to date. This may be due to the lack of knowledge of the proper heat treatment and as a better understand-

ing is obtained by experience the difficulties with joints may be overcome, as was the case on the introduction of the welded joint for wrought iron and steel pipe.

Finally, this is a very interesting subject and should be continued for future discussion.

TYPES OF JOINTS

Question No. 4. "In order to obtain data toward the standardization of pipe joints, give full information on the following:

"(a) In your opinion, what is the maximum diameter of pipe and the maximum pressure for which the following types of joint should be used:

Cement joints.
Combination lead and cement.
Welded joints.
Brazed joints.
Brazed couplings.
Lead joints.
Screw joints.

"(b) Are there any special conditions where you would use any of the above joints although you do not recommend them for standard practice? If so, state conditions.

"(c) What is your opinion of the B or No. 2 bell as compared with standard bell?"

The answers to these questions were so varied that it is impossible to draw any conclusions from them except that there is a real need for some special committee or committees to make an intensive study of one of the most important phases of distribution work.

Recommended Process for Bronze Welding

Cast iron pipe not exceeding 12-inch diameter

The Linde Air Products Company

New York, N. Y., June 4, 1925

AT the conclusion of a series of experiments and accompanying laboratory investigations about one year ago, bronze weld jointing of cast iron pipe was recommended by the Linde Air Products Company as a practical application of the oxy-acetylene welding process.

The application was recommended primarily for gas distribution lines, some of which were laid during the year and to date with the help of our service organization.

The following procedure control embodies recommended methods of bronze welding in laying cast iron lines of maximum 12 inch diameter. It is based upon experience accumulated through practically continuous contact with the subject application.

The suggestions and recommendations herein will materially assist in securing good results if applied with due regard to the individual conditions usually found in a field application which a procedure control cannot provide for in detail. (These have been omitted for want of space.—Edit.)

RATE OF CONSUMPTION PER CONSUMER

Question No. 5. "What, in your opinion, is the proper rate of consumption per consumer to use in designing a distribution system?"

Question No. 6. "Have you made actual tests of any part of your system to determine the consumption per consumer? If so, please submit data."

THE IDEAL SQUARE MILE

Question No. 8. "What is your idea of an ideal square mile of distribution? Show by sketch."

Thirty-two replies were received. Nine of these had no suggestions to offer or were not ready at the time of the preparation of this summary. Of the remaining twenty-three, sixteen submitted sketches and seven made some remark either describing an ideal piping layout or commenting on the general aspects.

The line seems to be at once drawn between high and low pressure methods of distribution. No doubt, many of the superintendents use high pressure distribution to some extent, but only three called for a high pressure layout alone, while fourteen presented low pressure systems, and only three described both high and low pressure. Opinion seems to be pretty well fixed that high pressure distribution is preferable for territory with scattered consumers, but for the built-up, congested sections, or those which are likely to become such, the low pressure system is desirable. This point has been very ably presented in Mr. Fuller's paper for the 1924 convention.

DISCUSSION OF A PAPER ENTITLED, "HIGH PRESSURE TRANSMISSION AND DISTRIBUTION OF GAS" PRESENTED AT THE 1924 CONVENTION OF THE AMERICAN GAS ASSOCIATION

Question No. 10. "It is planned to discuss Mr. Fuller's paper, which was presented at the last annual meeting of the American Gas Association, at the meeting of the committee in the Spring. What points would you like to have discussed?"

Mr. Fuller's paper was discussed at the time of its presentation but as few had had the opportunity of studying it before its presentation, it could not receive the full discussion that so important a subject merited.

The members of the 1925 Distribution Committee were asked to suggest points for further discussion at the Detroit Conference and the subjects were sent to Mr. Fuller for his answers. Mr. Fuller could not be present at the conference to take part in the discussion but carefully considered all the points raised and answered them.

The questions submitted to Mr. Fuller with his replies are given in the following. (Omitted for want of space.—Edit.)

AUTOMATIC LOADING DEVICES TO INCREASE CAPACITY

Question No. 11. "To what extent are you using automatic loading devices for increasing pressures of district regulators over peak loads? What type do you use and how successful is it?"

An analysis of the replies made by the various member companies to the question concerning the use of automatic loading devices on district regulators brings out the following:

Total number of answers classified	35
Number of companies using no automatic device	21
Number of companies regulating by control from distant point	5
Number of companies using automatic devices in governor pits	8

EFFECT OF HOUSE HEATING ON DISTRIBUTION

Question No. 21. "How many house heating plants are on your system?"
Question No. 22. "What is the maximum co-incident demand of these plants?"
Question No. 23. "What is the maximum non-co-incident demand of these plants?"
Question No. 24. "In what way has the installation of this load affected your distribution system?"

INSTALLATION OF MAINS IN PARKWAYS

Question No. 16. "What conditions should limit the installation of mains in parkways?"

A great majority of the answers favor the laying of mains in parkways under certain conditions and roadways under other conditions: the conditions in one city are entirely different from another, and what would be good policy in one might be bad and costly policy in another. It is a policy that depends upon local conditions.

It is assumed that when a gas main is laid in the parkway, it is necessary to lay two mains in this street as it certainly would not be good judgment to cross the entire street with house service installations. However, in cases where there are vaults in the parking which extend out to the curb, this would be bad construction.